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Environmental Impact Report

Transportation 2035 Plan for the San Francisco Bay Area

DRAFT

December 2008

State Clearinghouse No. 2008022101



CHANGE IN MOTION

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2035

TRANSPORTATION 2035 PLAN

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DRAFT ENVIRONMENTAL IMPACT REPORT

STATE CLEARINGHOUSE NO. 2008022101

Prepared for

Metropolitan Transportation Commission

by

DYETT & BHATIA
Urban and Regional Planners

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Executive Summary

This Program Environmental Impact Report (EIR) has been prepared on behalf of the Metropolitan Transportation Commission (MTC) in accordance with the California Environmental Quality Act (CEQA). It analyzes a proposed 25-year regional transportation plan, known as the Transportation 2035 Plan, prepared by MTC. The proposed Transportation 2035 Plan represents MTC's policy and action statement for how to approach the region's transportation needs over the next 25 years. The Transportation 2035 Plan proposes a set of future transportation projects and programs that can be implemented with available funding as well as identifies projects that could be considered if new funding is obtained. The Transportation 2035 Plan is intended to serve the region's mobility needs while addressing other important societal goals. The eight main goals of the proposed Transportation 2035 Plan are:

- A Safe and Well-Maintained System;
- A Reliable Commute;
- Efficient Freight Travel;
- Equitable Access to Mobility;
- Livable Communities;
- Clean Air;
- Climate Protection; and
- Security and Emergency Management.

MTC recognizes that transportation decisions have a role in supporting the economic and community vitality of the Bay Area. The proposed Transportation 2035 Plan represents MTC's best effort to guide the region in the development of a transportation system that meets the Bay Area's mobility needs through Transportation 2035 goals. The proposed Transportation 2035 Plan addresses the Bay Area's ground transportation system. Development and environmental analysis of regional airport and seaport plans occur in separate processes.

INTRODUCTION TO THE EIR

PURPOSE

This environmental assessment of the proposed Transportation 2035 Plan—which may also be referred to as the “proposed Project” throughout this document—fulfills the requirements of CEQA and the CEQA Guidelines and is designed to inform decision-makers, responsible and trustee agencies, and the general public of the range of potential environmental impacts that could result from implementation of the proposed Transportation 2035 Plan. This EIR recommends a set of measures to mitigate identified significant adverse regional environmental impacts. It also analyzes a range of alternatives to the proposed Transportation 2035 Plan. The final EIR will include a Mitigation Monitoring Program that identifies who will be primarily responsible for implementing mitigation measures. As the lead agency for preparing this EIR, MTC will use it in its review of the proposed Transportation 2035 Plan prior to taking action on the Plan.

SCOPE

The Transportation 2035 Plan EIR is a program EIR, as defined in Section 15168 of the CEQA Guidelines as: “[An EIR addressing a] series of actions that can be characterized as one large project and are related either: (1) Geographically; (2) A[s] logical parts in the chain of contemplated actions; (3) In connection with the issuance of rules, regulations, plans, or other general criteria to govern the conduct of a continuing program; or (4) As individual activities carried out under the same authorizing statutory or regulatory authority and having generally similar environmental impacts which can be mitigated in similar ways.”

As a programmatic document, this EIR presents a region-wide assessment of the potential impacts of the proposed Transportation 2035 Plan. Where appropriate, it also provides corridor-by-corridor or county-by-county assessment. However, it does not evaluate subcomponents of the proposed Transportation 2035 Plan nor does it assess project-specific impacts of individual projects, which are each required to separately comply with CEQA and/or NEPA as applicable.

EIR ORGANIZATION

The EIR is organized into four parts, outlined below. This Executive Summary outlines the proposed Project and alternatives, summarizes impacts and mitigation measures in Table S-1, identifies the environmentally superior alternative, and describes areas of known controversy.

PART ONE: INTRODUCTION AND PROJECT DESCRIPTION

Part One includes two chapters. *Chapter 1.1* describes the relationship between the proposed Transportation 2035 Plan and the EIR and describes the basic legal requirements of a program level EIR. It describes the level of analysis and the alternatives considered as well as how this EIR is related to other environmental documents and its intended uses. *Chapter 1.2* introduces the purpose and objectives of the proposed Transportation 2035 Plan and summarizes the components of the Plan and key growth projections and assumptions used in the EIR analysis. This includes a discussion of the existing project setting and an outline of the Bay Area’s projected population and employment growth rates and development patterns through the planning horizon to the year 2035. In addition, State and federal legislation that guides the development of the Transportation 2035 Plan process is described.

PART TWO: SETTING, IMPACTS, AND MITIGATION MEASURES

Part Two describes the existing environmental setting for each of the environmental issue areas analyzed in the EIR, the potential impacts that the proposed Transportation 2035 Plan would have on these areas, and measures to mitigate the potential significant impacts identified. Each impact area is analyzed in a separate chapter, organized as follows:

- Environmental Setting;
- Significance Criteria;
- Method of Analysis;
- Summary of Impacts; and
- Impacts and Mitigation Measures.

PART THREE: ALTERNATIVES AND CEQA REQUIRED CONCLUSIONS

Chapter 3.1 includes a description of the alternatives to the proposed Transportation 2035 Plan and an assessment of their potential to achieve the Plan's objectives while reducing potentially significant adverse regional environmental impacts. *Part Three* also includes a comparison and summary of potentially significant adverse regional environmental impacts that implementation of the alternatives would have for each of the environmental impact areas. As required by CEQA, an environmentally superior alternative is identified among the alternatives analyzed. *Chapter 3.2* includes an assessment of the impacts of the proposed Transportation 2035 Plan in several subjects areas required by CEQA, including:

- Significant unavoidable impacts;
- Significant irreversible environmental changes;
- Cumulative impacts; and
- Impacts found to be not significant.

PART FOUR: BIBLIOGRAPHY AND APPENDICES

All references and persons and agencies consulted are included in the *Bibliography*. *Appendix A* includes the Notice of Preparation (NOP) of this EIR. *Appendix B* includes the Responses to the NOP (comment letters) and the Scoping Meeting Summary. *Appendix C* is the complete project list for the proposed Transportation 2035 Plan and the four alternatives studied in the EIR. *Appendix D* is a Biological Resources Summary, including species lists and a detailed regulatory setting.

TRANSPORTATION 2035 PLAN BACKGROUND

The Bay Area region consists of nine counties: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma. In a ranking of primary census statistical areas, the San Jose-San Francisco-Oakland Combined Statistical Area (CSA) population was the sixth largest in the nation in 2007, behind New York, Los Angeles, Chicago, Washington-Baltimore-Northern Virginia, and Boston CSAs.^{1,2} At the start of 2008, the Department of Finance estimated the San Francisco Bay Area population at 7.3 million. According to ABAG's *Projections 2007*, only about 18 percent of the region's approximately 4.6 million acres of land is developed. Seventy-three percent of this developed land is in residential use. The Bay Area transportation network includes interstate and state freeways, county expressways, local streets and roads, bike paths, sidewalks, and a wide assortment of transit technologies (heavy rail, light rail, intercity rail, buses, trolleys and ferries).

¹ A primary census statistical area is a census defined metropolitan region that is not a component of another census defined metropolitan region. In the United States, the 719 primary census statistical areas currently defined by the United States Census Bureau include all 123 Combined Statistical Areas (CSAs) and the 596 Core Based Statistical Areas (CBSAs) that are not a component of a Combined Statistical Area.

² United States Census Bureau, 2007.

PROJECTED GROWTH

According to the Association of Bay Area Government's (ABAG) *Projections 2007*, the five most populous counties in 2005, in descending order, were Santa Clara, Alameda, Contra Costa, San Francisco, and San Mateo, accounting for 82 percent of the region's population. Santa Clara County is the most populous county in the Bay Area and is home to about 26 percent of the region's residents. The county's largest city, San Jose, is also the largest city in the Bay Area with a population of 943,000, or about 13 percent of the region's residents in 2005.³ Currently, there are 15 cities in the Bay Area with more than 100,000 residents.⁴

The Bay Area's population increased by about 13 percent (760,000) from 1990 to 2000, while jobs increased by about 14 percent (430,000).⁵ Between 2000 and 2005, the Bay Area population increased by another 5 percent, while jobs actually declined by 7-8 percent due to an economic downturn brought on, in part, by the "dot com bust". The highest employment numbers in 2005 were in the same five counties, though in a slightly different order: Santa Clara, Alameda, San Francisco, Contra Costa, and San Mateo; together, they accounted for 83 percent of Bay Area jobs that year. Looking ahead to 2035, ABAG projects that the Bay Area's population will grow another 27 percent from the 2005 level (nearly 2 million more residents) and employment will increase by 52 percent (1.8 million additional jobs).

PROPOSED PROJECT – TRANSPORTATION 2035 PLAN

A detailed description of the proposed Transportation 2035 Plan is included in Chapter 1.2. The proposed Transportation 2035 Plan represents the transportation policy and action statement of how the Bay Area will approach the region's transportation needs over the next 25 years. It was prepared by MTC in partnership with ABAG, Bay Area Air Quality Management District (BAAQMD), and San Francisco Bay Conservation and Development Commission (BCDC) and in collaboration with Caltrans, nine county-level Congestion Management Agencies (CMAs), over two dozen Bay Area transit operators, and numerous transportation stakeholders and the public. The purpose of the proposed Transportation 2035 Plan is to encourage and promote the safe and efficient management, operation and development of a regional intermodal transportation system that will serve the mobility needs of people and goods.

The proposed Transportation 2035 Plan is financially constrained, as defined in the past four plans, and consistent with federal planning regulations, as a set of future transportation projects and programs that can be implemented with federal, state, regional, or local revenue projected to be reasonably available over the next 25 years. It also includes illustrative transportation projects that would have benefits if additional revenues were secured in the future. For the proposed Transportation 2035 Plan, MTC's financial assumptions are based upon an examination of the historical growth trends of traditional and non-traditional revenue sources and retrospective analyses of predecessor long-range plans. A total of \$226 billion in projected revenue is estimated to be available under the proposed Transportation 2035 Plan.

³ Association of Bay Area Governments, 2007.

⁴ Department of Finance, May 2008a.

⁵ 1990 Census; California Economic Development Department, 2008.

Key new commitment projects funded by the \$32 billion in discretionary funds include: \$7 billion towards local road pavement maintenance; \$6.4 billion towards transit vehicle replacement and 25 percent of the highest-rated transit assets; \$6 billion for transit and roadway expansion projects; \$2.2 billion toward the Transportation for Livable Communities Program; \$1.6 billion toward the Freeway Performance Initiative; \$400 million towards the Regional Bicycle Network; and \$400 million toward the Lifeline Transportation Program.

The illustrative projects identified for the financially unconstrained element of the proposed Transportation 2035 Plan include: Dumbarton Rail, Caltrain Express Phase 2b, and Transbay Transit Center Phase 2. These projects are not fully funded and, therefore, not included in the financially constrained Transportation 2035 Plan. However, should funding become available and these projects become fully funded, they may be shifted into the financially constrained element of the plan.

ALTERNATIVES

A full description of the alternatives analyzed in this EIR and the alternative selection process is provided in *Chapter 3.1*. The alternatives are as follows:

NO PROJECT

The No Project alternative addresses the effect of not implementing the Transportation 2035 Plan. This alternative includes a set of transportation projects and programs that are in advanced planning stages and slated to go forward since they have full funding commitments. These projects are: (1) identified in the federally required Fiscal Year 2009 Transportation Improvement Program, a four-year funding program of Bay Area projects and programs, (2) not yet in the TIP but are fully funded sales tax projects authorized by voters in seven Bay Area counties, including San Francisco, Santa Clara, San Mateo, Alameda, Contra Costa, Sonoma and Marin, and (3) not yet in the TIP but fully funded through other committed funds as defined by statute or Commission policy. This alternative does not include transportation projects and programs funded by the \$32 billion in uncommitted discretionary funds.

HEAVY MAINTENANCE/CLIMATE PROTECTION EMPHASIS

This alternative is financially constrained to the \$220 billion projected revenue estimated to be available to the region over the next 25-years. Unlike the proposed Project, this Heavy Maintenance/Climate Protection alternative places its investment emphasis almost entirely on system maintenance and efficiency projects that support the plan goals.

This alternative maximizes the use of available discretionary funds for investments that (1) reduce shortfalls for transit and local roadway maintenance; (2) improve walkability, bicycling, transit access, and carpooling and ridesharing; (3) help local jurisdictions to plan and build housing near transit; and (4) implement public education and outreach programs to raise awareness and facilitate behavior changes that help the region to meet its climate protection goal. The set of projects and programs in this alternative is designed to reduce vehicle miles traveled and/or greenhouse gas emissions.

This alternative retains the plan expenditures for the \$194 billion in committed funds because these funds are committed to specific uses by statute or Commission policy, but redirects

uncommitted discretionary revenues. Because this alternative focuses on system maintenance and efficiency, it excludes all expansion, including the Regional HOT Network and the transit and roadway expansion projects that in the proposed Project are funded in part by the \$32 billion discretionary funds. As a result of the exclusion of the Regional HOT Network, the \$6.1 billion in net revenue that the Regional HOT Network would generate is not available to fund corridor improvements (such as transit operating and capital needs, freeway operations, interchanges, roadway maintenance and local access improvements).

HEAVY MAINTENANCE/CLIMATE PROTECTION EMPHASIS + PRICING

This alternative reflects the same project definition as Alternative 2 (Heavy Maintenance/Climate Protection Emphasis) plus it includes applying user-based pricing strategies in order to determine how pricing might influence the performance of infrastructure investments. The pricing strategies are intended to induce changes in travel behavior by increasing the cost of driving. They include: (a) carbon tax or tax on vehicle miles driven, (b) congestion fee for using congested freeways during peak periods, and (c) increased parking charges for all trips. No net revenue is estimated to be generated from these pricing strategies, for purposes of additional investments.

To represent the carbon tax or VMT tax, gas prices are assumed to increase by 21 percent from \$7.47 per gallon to \$9.07 in 2035 (all in 2008 current dollars). Overall, the total auto operating cost per mile would also increase by 21 percent, from 39 cents per mile to 47 cents per mile. For the congestion fee, a charge of 25 cents per mile on congested freeways is added to freeway segments where the volume-to-capacity ratio exceeds 0.90 (very congested facilities). For the parking charge, parking costs are increased by \$1.00 per hour to both peak and off-peak trips. This impacts both work and non-work trips, and has a higher impact on short trips than long trips. So, these increased parking costs will end up showing more non-motorized (bicycling and walking) trips in the pricing tests. The cumulative effect of these pricing strategies is a substantial increase in auto operating cost. This alternative aims to encourage more people to bike, walk and take transit, drive less, and produce less transportation-related greenhouse gas emissions by making it very expensive to drive.

HEAVY MAINTENANCE/CLIMATE PROTECTION EMPHASIS + LAND USE

This alternative reflects the same project definition as Alternative 2 (Heavy Maintenance/Climate Protection Emphasis) plus it includes an alternative land use forecast in order to determine how a different kind of regional growth might influence the performance of infrastructure investments. This alternative land use forecast is a policy forecast, as opposed to a purely market-driven outcome. ABAG staff produced this alternative land use forecast with the objective of balancing jobs and housing and targeting growth in existing communities and near transit. Compared to *Projections 2007*, this forecast reflects considerable shifts in regional growth away from the fringes and toward existing employment and housing centers, areas projected to have either household or employment growth, and areas with existing and/or planned transit. It also assumes fewer in-commuters from neighboring regions by accommodating 37,000 more households within the Bay Area. This alternative assumes no pricing strategy. This alternative is expected to maximize transit use and reduce auto trips and vehicle miles traveled because the land use strategy places projected population growth near existing and planned transit services and employment centers.

KEY EIR ASSUMPTIONS

In order to assess the effects of the proposed Transportation 2035 Plan, it is necessary to make assumptions about future environmental conditions at the time the Plan is fully implemented. Since implementation of the Plan would occur over 25 years, the horizon year is 2035.

Other key assumptions in the impact analysis include the following:

- The base year or existing conditions for the analysis is 2006, as that is the year for which MTC has the most current validated travel demand model for the transportation network. For comparisons where 2006 data are not available, the closest available year (typically 2005 or 2007) is used.
- ABAG's adopted *Projections 2007* forms the basis for developing future baseline population and employment scenarios for the proposed Project. See *Chapter 2.11: Growth Inducing Effects* for further details on growth projections.
- This analysis does not consider phasing of improvements or interim stages of the proposed Transportation 2035 Plan between 2005 and 2035, as the purpose of the analysis is to evaluate the Plan as a whole.
- As a program-level EIR, individual project impacts are not addressed; rather, this analysis focuses on the aggregate impacts of the Plan that may be regionally significant.

CUMULATIVE IMPACT ASSUMPTIONS

Some future impacts on the environment are not under the influence of MTC and occur for reasons unrelated to Transportation 2035 Plan investments. The term "cumulative impact", as defined in the CEQA Guidelines (Section 15355), "refers to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." Due to the size of planning area, this EIR uses a regional projections approach to assess the cumulative impacts of the proposed Transportation 2035 Plan. Where possible, this EIR distinguishes between the impacts of the Transportation 2035 Plan investment program as a whole and the independent impacts of forecast population and employment growth, which the projects and programs of the proposed Transportation 2035 Plan will serve. However, the transportation, air quality, greenhouse gases, and energy analyses evaluate the effects of the proposed Project assuming projected population and employment growth. Thus, the impact analyses for these four issue areas are cumulative for CEQA purposes.

PROJECT IMPACTS

The analysis emphasizes the impacts of the proposed Transportation 2035 Plan as a complete program, rather than as detailed analysis of the individual transportation improvements in the Plan. Individual improvements must still independently comply with the requirements of CEQA. As required by CEQA, this EIR identifies three types of impacts:

- Short-term impacts;
- Long-term impacts; and
- Cumulative impacts.

In some instances the cumulative impacts outlined in this EIR do not so much result from the transportation improvements in the Transportation 2035 Plan as from the growth these projects are intended to serve. Table S-1 summarizes the impact conclusions and recommended mitigation measures identified in this EIR. The impacts are organized by environmental impact area in the order in which they appear in *Part Two*.

ENVIRONMENTALLY SUPERIOR ALTERNATIVE

The CEQA Guidelines require each EIR to identify the environmentally superior alternative among the alternatives analyzed. If the No Project alternative is identified as the environmentally superior alternative, then the EIR must identify another alternative as environmentally superior among the alternatives analyzed.

There are tradeoffs among the various issue areas analyzed for the alternatives. The alternatives also would result in varying degrees of success at achieving the proposed Project objectives.

The main goals of the Plan were listed earlier in the *Executive Summary*. The performance objectives designed to measure the region's progress towards meeting those goals include: reducing vehicle miles traveled, congestion and carbon dioxide and particulate matter emissions, and collisions/fatalities; decreasing transportation and housing costs for low-income families; and improving system maintenance. Therefore, an alternative that performs substantially worse than the proposed Project with respect to meeting the plan goals would not achieve even the basic objectives of the proposed Project.

According to the environmental analysis, the Heavy Maintenance/Climate Protection Emphasis + Pricing alternative and the Heavy Maintenance/Climate Protection + Land Use alternative, perform better than the proposed Project overall, while the No Project and the Heavy Maintenance/Climate Protection Emphasis alternative perform comparably or slightly worse than the proposed Project. This preliminary finding does not account for legal restrictions and statutory authority.

Though both the Heavy Maintenance/Climate Protection Emphasis + Land Use alternative and Heavy Maintenance/Climate Protection + Pricing alternative perform very well, this CEQA analysis concludes that **the Heavy Maintenance/Climate Protection Emphasis + Pricing alternative is the environmentally superior alternative**, primarily because:

- It demonstrated superior performance in Energy and Climate Change issue areas which are of critical concern to the Bay Area today;
- It has more potential flexibility of applying and adjusting pricing controls to current needs;
- It can, in theory, be applied “immediately” and begin realizing environmental benefits sooner than land use changes; and
- It has a stronger potential market influence on new “green” technologies than land use changes.

In terms of objectives, the Heavy Maintenance/Climate Protection Emphasis alternative with the pricing and land use variations are both likely to meet most of the basic project objectives of the

proposed Project. However, despite this favorable evaluation, there are some important unanswered questions about the feasibility of each of these alternatives:

- The performance of the Heavy Maintenance/Climate Protection Emphasis + Land Use alternative is predicated on hypothetical land use assumptions that cannot be realized without substantial governmental intervention, through regulation or new incentives to create public funding for housing and infrastructure improvements and increased levels of public services and facilities which would be needed by the proposed intensification of residential development in the urban core. The regional agencies (MTC, ABAG, BCDC, and BAAQMD) do not currently have the power to enforce the assumed land use outcomes; local governments currently have authority over local land use decisions. Unresolved conflicts with local General Plans, “community character” concerns, and local economic development objectives also would affect realization of these land use assumptions.
- The performance of the Heavy Maintenance/Climate Protection Emphasis + Pricing alternative also presumes that regional agencies have certain authority to impose new pricing strategies, most of which are subject to legislative or voter approval. For those strategies that require legislative or voter approval, any economic downturn reduces public support for “taxing” schemes that intentionally raise the price of driving, particularly in the short term before households can locate closer to urban centers and transit. Though the Regional HOT Network will require new legislative authority to implement in the Bay Area, the magnitude of the legislative changes required for the aggressive pricing strategies proposed under this alternative are greater and possibly more contentious than changes required for the HOT Network.

While there were compelling reasons to evaluate both of these alternatives in full through this EIR, the feasibility issues indicate that MTC and its partners lack the authority to implement them.

AREAS OF KNOWN CONTROVERSY

Some areas of known controversy related to the proposed Transportation 2035 Plan and EIR include:

- Justifying the appropriateness, effectiveness, and equity of the Regional HOT Network included in the proposed Project;
- Determining how to reduce the public health impacts of particulate matter, primarily from diesel emissions associated with activities at the Port of Oakland, and establishing implementation responsibilities;
- Choosing the most appropriate and transparent approach to assessing and mitigating loss of Prime Farmland and Farmland of Statewide Importance at the program level;
- Determining the best analytical approach to evaluating greenhouse gas emissions and associated sea level risk impacts of the proposed Project, and the relationship between selected significance criteria, significance conclusions, and proposals for mitigation measures; and

- Identifying opportunities for “advance” mitigation designed to be implemented at a countywide or other regional level, rather than relying on project-level mitigation only.

This EIR acknowledges and attempts to address these known controversies as reported during the NOP scoping period and ongoing agency consultation.

SUMMARY TABLE OF IMPACTS AND MITIGATION MEASURES

Table S-1 starting on the following page summarizes impacts, mitigation measures, and significance conclusions after mitigation (far right column), by issue area. If a criterion was evaluated and no adverse impact was found, it is not summarized here. For more details, please see *Part Two: Settings, Impacts, and Mitigation Measures*.

Table S-1: Summary of Impacts and Mitigation

	Impact	Mitigation Measures	Significance After Mitigation
Transportation			
2.1-1	Accessibility to jobs by both auto and transit modes for all time intervals of 15, 30 and 45 minutes would improve compared to existing conditions.	None required.	Beneficial
2.1-2	Vehicle miles traveled at Level of Service F would increase for both freeways and expressways and arterial facilities when compared to existing conditions.	2.1-2(a) MTC, ABAG, BCDC and BAAQMD—as represented through the Joint Policy Committee (JPC) which coordinates the regional planning efforts of the four agencies—shall work to leverage existing funds (including the \$2.2 billion in funds committed in the proposed Transportation 2035 Plan for the Transportation for Livable Communities Program) and seek additional funds to provide financial incentives to local governments that volunteered to designate their communities as Priority Development Areas (PDAs) through the FOCUS program and commit to build higher density residential and mixed use development near transit. 2.1-2(b) MTC, in partnership with ABAG, BCDC, BAAQMD, local government and employers who would like to participate, will seek opportunities to conduct research on and promote value pricing of parking and other innovative parking strategies, for example: • Employer parking “cash out” programs, which allow employees to forego a parking spot in favor of cash or a subsidized transit pass; • Residential parking “opt-out” programs, which reduce city parking requirements in favor of developer funded cash to residents and/or transit passes, carshare membership, bicycle rentals, or alternative modes; • Local parking self-financing programs, which price parking to fund transit passes, alternative modes, and/or provide cash directly to workers and residents; • “Green certification” of local parking policy regulations aimed at reducing vehicle miles traveled; and • Technical assistance programs to remove barriers that prevent local governments from implementing parking pricing programs. 2.1-2(c) MTC shall advocate to state and federal legislators for new incentive funding for local governments to take steps to encourage higher density and mixed use developments near transit, including strategies such as (a) revising land use plans and zoning codes to remove barriers that may prevent such development; or (b) providing incentives to developers through density bonuses or expedited development review.	Significant Cumulative Impact, Contribution Not Cumulatively Considerable
2.1-3	Average weekday vehicle miles travelled per capita would increase slightly compared to existing conditions.	None required.	Less than significant

Table S-1: Summary of Impacts and Mitigation

	Impact	Mitigation Measures	Significance After Mitigation
Air Quality			
2.2-1	Construction-related emissions of criteria pollutants could increase due to the construction of projects in the proposed Project.	As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce construction-related air quality impacts that shall be considered by project sponsors and decision-makers may include, but are not limited to, those described below. 2.2(a) Typical mitigation measures that can be considered by project sponsors include: • Apply water or dust suppressants to exposed earth surfaces to control emissions at least twice daily; • All trucks hauling dirt, sand, soil, or other loose materials off-site shall be covered or wetted or shall maintain at least two feet of freeboard (i.e. minimum vertical distance between the top of the load and the top of the trailer); • All excavating and grading activities shall cease during periods of high winds; • All construction roads that have high traffic volumes, shall be surfaced with base material or decomposed granite, or shall be paved or otherwise be stabilized; • Public streets shall be cleaned, swept or scraped at frequent intervals or at least three times a week or once a day if visible soil material has been carried onto adjacent public roads (no mechanical "dry" sweeping shall be allowed); • Construction equipment shall be visually inspected prior to leaving the site and loose direct dirt shall be washed off with wheel washers as necessary; • Paving or water or non-toxic soil stabilizers shall be applied as needed to reduce off-site transport of fugitive dust from all unpaved access roads, parking and staging areas and other unpaved surfaces; • Traffic speeds on all unpaved surfaces shall not exceed 15 mph; • Low sulfur or other alternative fuels shall be used in construction equipment where feasible; • Idling time of construction vehicles and equipment shall not exceed five (5) minutes; • Construction vehicles shall be properly maintained and tuned; • Deliveries related to construction activities that affect traffic flow shall be scheduled during off-peak hours (e.g., 10:00 A.M. and 3:00 P.M.) and coordinated to achieve consolidated truck trips. When the movement of construction materials and/or equipment impacts traffic flow, temporary traffic control shall be provided to improve traffic flow (e.g., flag person); • To the extent possible, construction activity shall utilize electricity from power poles rather than temporary diesel power generators and/or gasoline power generators;	Significant

Table S-1: Summary of Impacts and Mitigation

Impact	Mitigation Measures	Significance After Mitigation
	- Hydroseed or apply non-toxic soil stabilizers to inactive construction areas; - Install sandbags or other erosion control measures to prevent silt run-off to public roadways; - Install wind breaks, or plant trees/vegetative wind breaks at windward side(s) of construction areas; - Maintain on-site truck loading zones; - Configure on-site construction parking to minimize traffic interference and to ensure emergency vehicle access; - Provide temporary traffic control during all phases of construction activities to improve traffic flow; - During construction, replace ground cover in disturbed areas as quickly as possible; - During the period of construction, install wheel washers where vehicles enter and exit unpaved roads onto paved roads, or wash off trucks and any equipment leaving the site each trip; - Employ a balanced cut/fill ration on construction sites, thus reducing haul truck trip emissions; - Construction sites/site operator shall comply with Bay Area Air Quality Management District Regulation 6, Rule 1- Particulate Matter; - Use an emissions calculator in the planning of every construction project that uses the proposed equipment fleet and hours of use to project reactive organic gases, nitrogen oxides, particulate matter, and carbon dioxide emissions, then quantify the reductions achievable through the use of cleaner/newer equipment; and - All off-road construction vehicles must be alternative fuel vehicles, or diesel-powered vehicles with the most recent CARB-certified tier or better engines or retrofitted/repowered to meet equivalent emissions standards.	
2.2-2	Emissions of ROG, NOx, and CO would decrease substantially compared to existing conditions.	None required.
2.2-3	Implementation of Transportation 2035 Plan projects, combined with projected regional growth, would result in increased emissions of PM10 and PM2.5 over existing conditions.	2.2(b) MTC and BAAQMD, in partnership with ARB and other partners who would like to participate, shall work to leverage existing air quality and transportation funds and seek additional funds to continue to implement the BAAQMD's Lower-Emission School Bus Program (LESBP) to retrofit older diesel school buses with emission control devices and replace older school buses with clean school buses, and to develop and implement other similar programs aimed at retrofits and replacements of heavy duty fleet vehicles. 2.2(c) MTC and BAAQMD, in partnership with the Port of Oakland, ARB, and other partners who would like to participate, shall work together to identify, prioritize and implement actions beyond those identified in the Statewide Goods Movement Emission Reduction Plan to reduce diesel PM and other air emissions. 2.2(d) MTC and BAAQMD, in partnership with the Port of Oakland, ARB, and other partners who would like to participate, shall work together to secure incentive funding that may be available through the Carl Moyer Memorial Air Quality Standards Attainment Program to reduce port-related emissions. 2.2(e) MTC and BAAQMD, in partnership with the Port of Oakland, ARB, and other partners who would like to participate, shall work together to secure Proposition 1B Goods Movement Emission Reduction Program funds to invest in Bay Area related programs. These funds directly support early and accelerated diesel PM reduction programs and can help ease the transition into compliance with adopted and

Table S-1: Summary of Impacts and Mitigation

		Significance After Mitigation
	Impact Mitigation Measures proposed ARB regulations. 2.2(f) MTC and BAAQMD, in partnership with the Port of Oakland, ARB, and other partners who would like to participate, shall work together to develop and seek resources for the San Francisco Bay Area Green Ports Initiative, which is a program to reduce air pollution from trucks, ships and other equipment associated with Bay Area port operations.	
2.2-4	Emissions of diesel particulate matter, 1, 3-butadiene, and benzene (toxic air contaminants) would decrease substantially compared to existing conditions. None required.	Beneficial
Land Use and Housing		
2.3-1	Implementation of the proposed Transportation 2035 Plan could convert farmland, including prime agricultural land designated by the State of California, to transportation use. 2.3(a) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce impacts on farmlands that shall be considered by project sponsors and decision-makers may include, but are not limited to, those described below. • Corridor realignment, where feasible, to avoid farmland, especially Prime Farmland; • Conservation easements on land at least equal in quality and size as partial compensation for the direct loss of agricultural land; • Abiding by the proper notification provisions of the Williamson Act when it appears that land enrolled in a Williamson Act contract may be required for a public use, is acquired, the original transportation improvement for the acquisition is changed, or the land acquired is not used for the improvement; • If a Williamson Act contract is terminated, the Department of Conservation recommends a ratio greater than 1:1 of land equal in quality be set aside in a conservation easement; • Instituting new protection of farmland in the project area or elsewhere in the County through the use of less than permanent long-term restrictions on use, such as 20-year Farmland Security Zone contracts (Government Code Section 51296 et seq.) or 10-year Williamson Act contracts (Government Code Section 51200 et seq.); • Mitigation fees that support the commercial viability of the remaining agricultural land in the project area, County, or region through a mitigation bank that invests in agricultural infrastructure, water supplies, marketing, etc; • Minimize severance of agricultural land by constructing underpasses and overpasses at reasonable intervals to provide property access; • Agricultural enhancement investments such as supporting farmer education on organic and sustainable practices, assisting with organic soil amendments for improved production, and upgrading irrigation systems for water conservation; • Berms, buffer zones, setbacks, and fencing to reduce use conflicts between transportation facilities and farming uses and to protect the functions of farmland; and • Other conservation tools available from the California Department of Conservation's Division of Land Resource Protection.	Significant

Table S-1: Summary of Impacts and Mitigation

	<i>Impact</i>	<i>Mitigation Measures</i>	<i>Significance After Mitigation</i>
2.3-2	Implementation of the proposed Transportation 2035 Plan could disrupt or displace existing land uses, neighborhoods, and communities in the short term.	2.3(b) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce short-term (often construction-related) disruption or displacement of existing land uses, specifically residential, commercial, or urban open space impacts that shall be considered by project sponsors and decision-makers may include, but are not limited to, those described below. • Berms and fencing to reduce conflicts between transportation facilities and existing uses. • Regulate construction operations on existing facilities to minimize traffic disruptions and detours, and to maintain safe traffic operations. • Ensure construction operations are limited to regular business hours where feasible. • Control construction dust and noise. • Control erosion and sediment transport in stormwater runoff from construction sites. Additional applicable mitigation measures are listed under the short-term construction-related impact in <i>Chapter 2.2: Air Quality</i>, and are included here by reference.	Significant
2.3-3	Transportation improvements in the proposed Transportation 2035 Plan have the potential to cause long-term community disruption.	2.3(c) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce long-term disruption or displacement of existing communities that shall be considered by project sponsors and decision-makers may include, but are not limited to, those described below. • Berms and fencing to reduce conflicts between transportation facilities and existing uses; • Pedestrian and bike connectors across widened sections of roadway; • Sidewalk, signal, and signage treatments to improve the pedestrian connectivity across widened sections of roadway; • Corridor realignment, where feasible, to avoid land use disruption; and • Buffer zones and setbacks to protect the continuity of land uses. 2.3(d) Through regional programs such as the Transportation for Livable Communities Program, Regional Bicycle Program, etc., MTC shall continue to support locally sponsored traffic calming and alternative transportation initiatives, such as paths, trails, overcrossings, bicycle plans, and the like that foster improved neighborhoods and community connections.	Less than significant
2.3-4	Implementation of the proposed Transportation 2035 Plan may conflict with existing local plans.	None required.	Less than significant

Table S-1: Summary of Impacts and Mitigation

	<i>Impact</i>	<i>Mitigation Measures</i>	<i>Significance After Mitigation</i>
2.3-5	Concurrent implementation of the proposed Transportation 2035 Plan and forecast development would result in cumulatively considerable conversion of Prime and Important farmlands to urban use throughout the Bay Area.	2.3(e) MTC shall continue to participate in and promote the efforts of the multi-agency FOCUS project, which is intended to coordinate regional growth efforts to use land more efficiently, optimize transportation and other infrastructure investments in existing communities that focus new development near existing transit, preserve open space, etc. In this way, MTC, in partnership with regional agencies such as ABAG and advocacy groups such as Greenbelt Alliance and TransForm (formerly TALC), can pursue the enhanced coordination of local land use planning with transportation investments in the proposed Transportation 2035 Plan.	Significant Cumulative Impact, Contribution Cumulatively Considerable
Energy			
2.4-1	Implementation of the proposed Transportation 2035 Plan, combined with regional growth and improvements in vehicle technology, is likely to result in decreased transportation-related energy consumption compared to existing conditions.	None required.	Beneficial
Greenhouse Gases and Climate Change			
2.5-1	Implementation of Transportation 2035 Plan projects, combined with forecast regional growth, would contribute to GHG emissions.	2.5(a) MTC shall commit to working with ABAG, BCDC, and BAAQMD, through the JPC, to develop a set of “green construction” policies and best practices that encourage use of lowest emitting construction equipment and fuels (e.g., diesel-powered vehicles meeting the most current CARB-certified tier or better engines). 2.5(b) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce impacts related to greenhouse gas emissions that shall be considered by project sponsors and decision-makers may include, but are not limited to, those described below. • Adopt and implement “green building” standards for any public buildings (transit stations, ferry buildings, maintenance facilities, etc) funded by MTC to achieve a LEED™ Silver or better or equivalent certification. • Use light colored pavement for solar reflectivity and reduced heat island effects wherever construction costs are no higher than 5 or 10 percent of the least cost alternative paving material. • Install solar photovoltaic systems or use of renewable sources of energy for transportation buildings and maintenance facilities, wherever “feasible”, as the term is defined in CEQA. • Plant shade trees as part of specified types of construction projects or wherever	Significant Cumulative Impact, Contribution Not Cumulatively Considerable

Table S-1: Summary of Impacts and Mitigation

		Significance After Mitigation
Impact	Mitigation Measures	
	construction results in loss of tree cover, because trees have carbon sequestration capacity. - Establish or update minimum standards for construction management, including specifying minimum content for recycled products in aggregate, concrete, etc. and construction waste management. - Establish standards or incentives for light pollution reduction related to street lighting and lighting of transportation and parking facilities to promote low-energy use for permanent as well as temporary fixtures. See also <i>Chapter 2.1: Transportation</i> and <i>Chapter 2.2: Air Quality</i> which contain mitigation that would help to further reduce greenhouse gas emissions from transportation projects.	
2.5-2	Transportation 2035 Plan projects, combined with future forecast development in the region, have the potential to result in a cumulatively considerable increase in exposure to risk related to sea level rise. 2.5(c) MTC will work with BCDC, in partnership with the regional agencies and other partners who would like to participate, to conduct a vulnerability assessment for the region's transportation infrastructure and identify the appropriate adaptation strategies to protect those transportation resources that are likely to be impacted and are a priority for the region to protect. This assessment should build off of but not duplicate current BCDC efforts and research underway. 2.5(d) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce impacts related to sea level rise that shall be considered by project sponsors and decision-makers may include, but are not limited to, those described below. - Engineering designs for new transportation projects shall demonstrate that they have factored in sea level rise and potential increases in storm surge inundation, and are budgeting for and already incorporate mitigation measures to adapt to projected sea level rise and storm surge. These mitigation measures should consider the effects on Bay and coastal zone resources and avoid or reduce future risk to the infrastructure and the region. - For those transportation projects that do not involve new infrastructure but increase capacity of existing infrastructure, project sponsors shall demonstrate that they have investigated the vulnerability of their existing facilities to sea level rise and storm surge inundation and have budgeted for mitigation measures to adapt to projected sea level rise and storm surge. These mitigation measures should consider the effects on Bay and coastal zone resources and avoid or reduce future risk to the infrastructure and the region.	Significant Cumulative Impact, Contribution Not Cumulatively Considerable
Noise		
2.6-1	Construction of the proposed Transportation 2035 Plan projects would have short-term noise impacts on surrounding areas. None required.	Less than significant
2.6-2	Transportation 2035 Plan projects could result in noise levels that approach or As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA.	Less than significant

Table S-1: Summary of Impacts and Mitigation

	<i>Impact</i>	<i>Mitigation Measures</i>	<i>Significance After Mitigation</i>
	exceed the FHWA Noise Abatement Criteria or could cause noise levels to increase by 3 dBA or more when compared to existing conditions.	MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce noise impacts that shall be considered by project sponsors and decision-makers may include, but are not limited to, those described below. 2.6(a) Adjustments to proposed roadway or transit alignments to reduce noise levels in noise sensitive areas. For example, below-grade roadway alignments can effectively reduce noise levels in nearby areas. 2.6(b) Techniques such as landscaped berms, dense plantings, reduced-noise paving materials, and traffic calming measures in the design of their transportation improvements. 2.6(c) Contributing to the insulation of buildings or construction of noise barriers around sensitive receptor properties adjacent to the transportation improvement.	
2.6-3	Implementation of the proposed Transportation 2035 Plan could result in increased noise and groundborne vibration related to transit operations.	Mitigation measures 2.6(a) through 2.6(c) above are considered appropriate for bus transit noise impacts. In addition to those mitigation measures, the following additional measures are provided to reduce Impact 2.6-3 as it pertains to rail transit: 2.6(d) Design approaches to reduce noise and vibration impacts of rail transit, such as vibration isolation of track segments, use of continuously welded track to minimize wheel noise, resilient wheels, vehicle skirts, wheel truing, rail grinding, undercar absorption, or vehicle horn loudness and pitch adjustments. 2.6(e) Operational changes to reduce noise impacts of rail transit, such as assisting local jurisdictions in pursuing Quiet Zones.	Less than significant
2.6-4	The proposed Transportation 2035 Plan, combined with traffic related to projected regional population and employment growth, could result in a cumulatively considerable increase in overall noise levels along some travel corridors.	Mitigation measures 2.6(a) through 2.6(e) above help to reduce this cumulative impact.	Significant Cumulative Impact, Contribution Cumulatively Considerable

Geology

2.7-1	Seismic activity resulting in surface rupture, ground shaking, liquefaction, landslides or tsunamis could damage existing and proposed transportation infrastructure and pose public safety risks.	2.7(a) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce significant seismic impacts, as determined by a State licensed geotechnical professional, that shall be considered by project sponsors and decision-makers may include, but are not limited to, those described below. - Consider seismicity of the site, soil response at the site, and dynamic characteristics of the structure in the seismic design of the project, in compliance with the California Building Code and Caltrans' standards for construction, or other more stringent standards, as applicable. - Facilitate geotechnical analyses as necessary within construction areas to ascertain soil types and local faulting prior to preparation of project designs.	Less than significant
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Table S-1: Summary of Impacts and Mitigation

			Significance After Mitigation
Impact	Mitigation Measures		
	- For projects located within Alquist-Priolo Earthquake Fault Zones, prepare recommendations for the mitigation and reduction of hazards in accordance with California Geological Survey Guidelines for Evaluation the Hazard of Earthquake Fault Rupture. - Avoid or stabilize landslide areas and potentially unstable slopes wherever feasible. - For projects located within liquefaction or earthquake-induced landslide Seismic Hazard Zones, prepare recommendations for the mitigation and reduction of hazards in accordance with California Geological Survey Guidelines for Evaluating and Mitigating Seismic Hazards Special Publication 117. - For projects adjacent to the Bay and/or Pacific Ocean, evaluate tsunami inundation risks and implement, where necessary and feasible, precautionary measures, such as specifying final roadbed elevations greater than the expected height of a tsunami with a given return frequency.		
2.7-2	Highway and rail construction could require significant earthwork and road cuts, which could increase short-term and long-term soil erosion potential.	2.7(b) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures that shall be considered by project sponsors and decision-makers may include, but are not limited to, Best Management Practices to reduce soil erosion by water and wind. These could include temporary cover of exposed, engineered slopes, or silt fencing. Where required, based on affected area (greater than one acre), agencies shall adhere to the requirements of the NPDES General Construction Permit and associated SWPPP.	Less than significant
2.7-3	Highway and rail construction could require significant earthwork and road cuts, which could destabilize existing slopes causing landslides or slope failure.	2.7(c) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures that shall be considered by project sponsors and decision-makers may include, but are not limited to, ensuring that project designs provide adequate slope drainage and appropriate landscaping to minimize the occurrence of slope instability and erosion. Road cuts shall be designed to maximize the potential for revegetation. Project sponsors shall ensure that local grading ordinances and building code requirements are strictly adhered to where appropriate.	Less than significant
2.7-4	Projects built on highly compressible or expansive soils could become damaged and weakened over time.	2.7(d) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures that shall be considered by project sponsors and decision-makers may include, but are not limited to, ensuring that geotechnical investigations be conducted by qualified professionals (registered civil and geotechnical engineers, registered engineering geologists) to identify the potential for differential settlement and expansive soils and to recommend corrective measures, such as structural reinforcement and replacing soil with engineered fill. Recommended measures shall be incorporated into project designs.	Less than significant

Table S-1: Summary of Impacts and Mitigation

	<i>Impact</i>	<i>Mitigation Measures</i>	<i>Significance After Mitigation</i>
2.7-5	The proposed Transportation 2035 Plan, combined with regional population growth, would result in an increased risk of exposure of people and property to geologic hazards.	Same as those outlined above.	Significant Cumulative Impact, Contribution Not Cumulatively Considerable

Water Resources

2.8-1	Construction of Transportation 2035 Plan projects could adversely affect water quality and drainage patterns in the short-term due to erosion and sedimentation.	2.8(a) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce impacts on water resources that shall be considered by project sponsors and decision-makers may include, but are not limited to, those described below. Project sponsors shall prepare and implement, as necessary, a Storm Water Pollution Prevention Plan (SWPPP) in accordance with the SWRCB's General Construction Permit. The SWPPP shall be consistent with the Manual of Standards for Erosion and Sedimentation Control by the Association of Bay Area Governments, the California Stormwater Quality Association (CASQA), Stormwater Best Management Practice Handbook for Construction, policies and recommendations of the local urban runoff program (city and/or county), and the recommendations of the RWQCB. Implementation of the SWPPP shall be enforced by inspecting agencies during the construction period via appropriate options such as citations, fines, and stop-work orders. Typical components of a SWPPP would include the following: - Excavation and grading activities shall be scheduled for the dry season only (April 15 to October 15), to the extent feasible. This will reduce the chance of severe erosion from intense rainfall and surface runoff, as well as the potential for soil saturation in swale areas. - If excavation occurs during the rainy season, storm runoff from the construction area shall be regulated through a stormwater management/erosion control plan that may include temporary on-site silt traps and/or basins with multiple discharge points to natural drainages and energy dissipaters. Stockpiles of loose material shall be covered and runoff diverted away from exposed soil material. If work is stopped due to rain, a positive grading away from slopes shall be provided to carry the surface runoff to areas where flow can be controlled, such as the temporary silt basins. Sediment basin/traps shall be located and operated to minimize the amount of offsite sediment transport. Any trapped sediment shall be removed from the basin or trap and placed at a suitable location on-site, away from concentrated flows, or removed to an approved disposal site. - Temporary erosion control measures shall be provided until perennial revegetation or landscaping is established and can minimize discharge of sediment into nearby waterways. For construction within 500 feet of a water body, fiber rolls and/or gravel bags shall be placed upstream adjacent to the water body.	Less than significant
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Table S-1: Summary of Impacts and Mitigation

			Significance After Mitigation
	Impact	Mitigation Measures	
		- After completion of grading, erosion protection shall be provided on all cut-and-fill slopes. Revegetation shall be facilitated by mulching, hydroseeding, or other methods and shall be initiated as soon as possible after completion of grading and prior to the onset of the rainy season (by October 15). - Permanent revegetation/landscaping shall emphasize drought-tolerant perennial ground coverings, shrubs, and trees to improve the probability of slope and soil stabilization without adverse impacts to slope stability due to irrigation infiltration and long-term root development. - BMPs selected and implemented for the project shall be in place and operational prior to the onset of major earthwork on the site. The construction phase facilities shall be maintained regularly and cleared of accumulated sediment as necessary. - Hazardous materials such as fuels and solvents used on the construction sites shall be stored in covered containers and protected from rainfall, runoff, and vandalism. A stockpile of spill cleanup materials shall be readily available at all construction sites. Employees shall be trained in spill prevention and cleanup, and individuals should be designated as responsible for prevention and cleanup activities. SWPPP(s) for projects immediately adjacent to or within drainages also will have to incorporate the following additional erosion control minimum criteria: - Construction equipment shall not be operated in flowing water, except as may be necessary to construct crossings or barriers. - Stream diversion structures shall be designed to preclude accumulation of sediment. If this is not feasible, an operation plan shall be developed to prevent adverse downstream effects from sediment discharges. - Where working areas are adjacent to or encroach on live streams, barriers shall be constructed that are adequate to prevent the discharge of turbid water in excess of specified limits. The discharged water shall not exceed 110 percent of the ambient stream turbidity of the receiving water, if the receiving water is a flowing stream with turbidity greater than 50 nephelometric turbidity unit (NTU), or 5 NTU above ambient turbidity for ambient turbidities that are less than or equal to 40 NTU. If the water is discharged to a dry streambed, the discharged water shall not exceed 50 NTU. - Material from construction work shall not be deposited where it could be eroded and carried to the stream by surface runoff or high stream flows. - Riparian vegetation shall be removed only when absolutely necessary.	
2.8-2	Transportation 2035 Plan projects could adversely affect water resources in the long term by reducing permeable surfaces, which could result in additional runoff and erosion, degrade water quality in receiving waters, decrease groundwater recharge, or alter drainage patterns.	2.8(b) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce impacts on water resources that shall be considered by project sponsors and decision-makers may include, but are not limited to, requiring projects to comply with design guidelines established in the Bay Area Stormwater Management Agencies Association's (BASMAA) <i>Using Start at the Source to Comply with Design Development Standards</i> and the <i>California Storm Water Best Management Practice Handbook for New Development and Redevelopment</i> to minimize both increases in the volume and rate of stormwater runoff, and the amount of pollutants entering the storm drain system. Typical mitigation measures shall include the following:	Less than significant

Table S-1: Summary of Impacts and Mitigation

Impact	Mitigation Measures	Significance After Mitigation
	<i>Surface Water</i> • Drainage of roadway and parking lot runoff shall, wherever possible, be designed to run through grass median strips, contoured to provide adequate storage capacity and to provide overland flow, detention, and infiltration before it reaches culverts. Detention basins and ponds, aside from controlling runoff rates, can also remove particulate pollutants through settling. Facilities such as oil and sediment separators or absorbent filter systems shall therefore be designed and installed within the storm drainage system to provide filtration of stormwater prior to discharge and reduce water quality impacts whenever feasible. For example, runoff shall be filtered through mechanical or natural filtration systems such as pre-manufactured oil water separators or through natural processes such as bioswales and settlement ponds to remove oil and grease prior to discharge. • Long-term sediment control shall include an erosion control and revegetation program designed to allow reestablishment of native vegetation on slopes in undeveloped areas. • In areas where habitat for fish and other wildlife would be threatened by transportation facility discharge, alternate discharge options shall be sought to protect sensitive fish and wildlife populations. Maintenance activities over the life of the project shall include heavy-duty sweepers, with disposal of collected debris in sanitary landfills to effectively reduce annual pollutant loads where appropriate. Catch basins and storm drains shall be cleaned and maintained on a regular basis. • Landscaped areas shall use Integrated Pest Management techniques (methods that minimize the use of potentially hazardous chemicals for landscape pest control and vineyard operations). The handling, storage, and application of potentially hazardous chemicals shall take place in accordance with all applicable laws and regulations. <i>Groundwater</i> • Detention basins, infiltration strips, and other features to facilitate groundwater recharge shall be incorporated into the design of new freeway and roadway facilities whenever feasible. <i>Flooding</i> • Projects shall be designed so that they do not increase downstream flooding risks by increasing peak runoff volumes. Including detention ponds in designs for roadway medians, parking areas, or other facilities, or increasing the size of local flood control facilities serving the project areas could achieve this measure. Existing pervious surface shall be preserved to the maximum extent feasible to minimize increases in stormwater runoff volumes and rates. • Projects shall be designed to allow lateral transmission of stormwater flows across transportation corridors with no increased risk of upstream flooding. Culverts and bridges shall be designed to adequately carry drainage waters through project sites. The bottom of overpass structures should be elevated at least 1 foot above the 100-year flood elevation at all stream and drainage channel crossings. • All roadbeds for new highway and rail transit facilities shall be elevated at least 1 foot above the 100-year base flood elevation.	

Table S-1: Summary of Impacts and Mitigation

	<i>Impact</i>	<i>Mitigation Measures</i>	<i>Significance After Mitigation</i>
2.8-3	Concurrent implementation of the proposed Transportation 2035 Plan and projected regional development could contribute to degradation of regional water quality, reduction of groundwater recharge, or result in increased flooding hazards.	Mitigation measures 2.8(a) and 2.8(b) provided above.	Significant Cumulative Impact, Contribution Not Cumulatively Considerable.
Biological Resources			
2.9-1	Transportation 2035 Plan projects could adversely affect wetlands and aquatic resources.	2.9(a) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce impacts on wetlands and aquatic resources that shall be considered by project sponsors and decision-makers may include, but are not limited to, those described below. • In keeping with the “no net loss” policy, project designs shall be configured, whenever possible, to avoid sensitive wetlands and avoid disturbances to wetland and riparian corridors in order to preserve both the habitat and the overall ecological functions of these areas. Projects shall minimize ground disturbances and construction footprints near such areas to the extent practicable. • Where avoidance of wetlands is not feasible, project sponsors will minimize fill and the use of in-water construction methods, and only do so with express permit approval from the appropriate resources agencies and in accordance with applicable existing regulations such as Coastal Zone regulations of wetland fill. Project sponsors shall arrange for off-site replacement of removed wetlands in accordance with the applicable existing regulation and subject to approval by the Corps, and possibly by the USFWS, RWQCB, and CDFG.	Less than significant
2.9-2	Transportation 2035 Plan projects could cause substantial disturbance of biologically unique or sensitive communities.	2.9(b) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce impacts on biologically unique or sensitive communities that shall be considered by project sponsors and decision-makers may include, but are not limited to, those described below. • In accordance with CDFG guidelines, project sponsors shall make an effort to minimize impacts on sensitive plant communities, especially riparian habitats, when designing and permitting projects. Where applicable, projects shall conform to the provisions of special area management or restoration plans such as the Suisun Marsh Protection Plan, which outlines specific measures to protect sensitive vegetation communities.	Less than significant

Table S-1: Summary of Impacts and Mitigation

	<i>Impact</i>	<i>Mitigation Measures</i>	<i>Significance After Mitigation</i>
2.9-3	Transportation 2035 Plan projects could have deleterious impacts on special-status plant and/or wildlife species identified as endangered, candidate, and/or special-status.	2.9(c) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce impacts on special-status plant or animal species that shall be considered by project sponsors and decision-makers may include, but are not limited to, those described below. • In support of CEQA, NEPA, CDFG and USFWS permitting processes for individual Transportation 2035 Plan transportation projects, biological and wetland surveys shall be conducted as part of the environmental review process to determine the presence and extent of sensitive habitats and/or species in the project vicinity. Surveys shall follow established methods and shall be undertaken at times when the subject species is most likely to be identified. In cases where impacts to State- or federal-listed plant or wildlife species are imminent, formal protocol-level surveys may be required on a species-by-species basis to determine the local distribution of these species. Consultation with the USFWS and/or CDFG shall be conducted early in the planning process at an informal level for transportation projects that could adversely affect federal or State candidate, threatened, or endangered species to determine the need for further consultation or permitting actions. • When drafting mitigations, adaptive management strategies shall be used, when feasible, to capitalize on the progressive understanding of ecological systems and management practices, apply lessons learned from current and future projects and research studies, accommodate for uncertainties or unknowns, and improve progress toward desired ecological outcomes. • Project designs shall be reconfigured, whenever possible, to avoid sensitive wetland or biological resources and avoid disturbances to wetland and riparian corridors. Projects shall minimize ground disturbances and construction footprints near sensitive areas to the extent practicable. • To the extent practicable, project activities in the vicinity of sensitive resources shall be completed during the period that best avoids disturbance to plant and wildlife species present (e.g., May 15 to October 15 near salmonid habitat and vernal pools). • Individual projects shall minimize the use of in-water construction methods in areas that support sensitive aquatic species, especially when listed species could be present. • In the event that equipment needs to operate in any watercourse with flowing or standing water, a qualified biological resource monitor shall be present at all times to alert construction crews to the possible presence of California red-legged frog, nesting birds, salmonids, or other aquatic species at risk during construction operations. • If project activities involve pile driving or vibratory hammering in or near water, interim hydroacoustic threshold criteria for fish should be adopted as set forth by the Interagency Fisheries Hydroacoustic Working Group, as well as other avoidance methods to reduce the adverse effects of construction to sensitive fish, piscivorous birds, and marine mammal species. • Construction periods shall not occur during the breeding season near riparian habitat, freshwater marshlands, and salt marsh habitats that support nesting bird species protected under the Endangered Species Act and Migratory Bird Treaty Act (e.g., yellow warbler, tricolored blackbird, California clapper rail, etc.). • A qualified biologist shall locate and fence off sensitive resources before	Significant

Table S-1: Summary of Impacts and Mitigation

Summary of Impacts and Mitigation			Significance After Mitigation
Impact	Mitigation Measures		
	construction activities begin and, where required, shall inspect areas to ensure that barrier fencing, stakes, and setback buffers are maintained during construction. - For work sites located adjacent to special-status plant or wildlife populations, a biological resource education program shall be provided for construction crews and contractors (primarily crew and construction foremen) before construction activities begin. - Biological monitoring shall be particularly targeted for areas near identified habitat for federal- and state-listed species, and a “no take” approach shall be taken whenever feasible during construction near special-status plant and wildlife species. - Efforts shall be made to minimize the negative effects of light and noise on listed and sensitive wildlife.		
2.9-4	Transportation 2035 Plan projects could have deleterious impacts on proposed or designated critical habitats.	Mitigation measures 2.9(a) through 2.9(c), above, are expected to reduce impacts on steelhead critical habitat to less-than-significant. Specific projects that may be located within other critical habitat areas will be subject to established protocols for surveys and protective measures. As described in these mitigation measures, project designs shall be reconfigured to avoid or minimize adverse affects to the primary constituent elements of designated critical habitats to the extent practicable, and consultation with the USFWS shall be conducted early in the process at an informal level to determine the need for further mitigation, consultation, or permitting action. No further program-level mitigation measures are required.	Less than significant
2.9-5	Construction activities could adversely affect nonlisted nesting raptor species considered special-status by CDFG under CDFG Code 3503.5.	2.9(d) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce impacts on nonlisted nesting raptor species that shall be considered by project sponsors and decision-makers may include, but are not limited to, those described below. - To avoid and minimize impacts to nesting raptors, preconstruction surveys shall be performed prior to initiating construction activities during the breeding season (February 1 through August 31). If it is determined that young have fledged and are self-sufficient, no further mitigation would be required. - To avoid and minimize potential impacts to nesting raptors, a no-disturbance buffer zone shall be established around active nests during the breeding season. - The size of individual buffers could be adjusted based on an evaluation of the site by a qualified raptor biologist in cooperation with the USFWS and CDFG.	Less than significant
2.9-6	Construction activities could adversely affect non-listed nesting birds species, considered special-status by the USFWS under the federal Migratory Bird Treaty Act, and by CDFG under the CDFG Code 3503 and 3513.	2.9(e) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. At the time of project certification, project sponsors shall agree to comply with mitigation measures to avoid impacts to nesting bird species protected under the federal Migratory Bird Treaty Act, as follows: Concurrent with surveys described in Mitigation Measure 2.9(d), surveys shall be performed for migratory birds listed in the federal List of Migratory Birds (50	Less than significant

Table S-1: Summary of Impacts and Mitigation

Impact	Mitigation Measures	Significance After Mitigation
	Code of Federal Regulations, Chapter 1, Part 10 Section 10.13). More than 500 native and migratory bird species are protected by this statute. If protected breeding birds are detected during surveys, a buffer zone, depending upon the species identified, shall be established around active nesting sites in coordination with CDFG and the USFWS.	
2.9-7 Implementation of the Transportation 2035 Plan could conflict with adopted resource protection or conservation plans.	As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce conflicts with adopted resource protection or conservation plans shall be considered by project sponsors and decision-makers may include, but are not limited to, those described below. 2.9(f) Project sponsors whose projects are located within the coastal zone shall carefully review the applicable local coastal program for potential conflicts, and involve the California Coastal Commission as early as possible in the project-level EIR process. 2.9(g) Relevant Conservation Measures, including species surveys and road design requirements, shall also apply, wherever feasible, to <i>non-covered</i> MTC transportation projects that fall within the ECCC HCP boundaries, as well as Plan projects outside the ECCC HCP boundaries, because issues related to wildlife road mortality, habitat fragmentation, wildlife corridor connectivity, and pre-and post-project wildlife monitoring are applicable to all transportation projects, not just those located within the HCP coverage area. For rural infrastructure projects, this includes but is not limited to the following Conservation Measure: <i>Conservation Measure 1.14: Design Requirements for Covered Roads outside the UDA</i> Siting Requirements - Planned roads will be located in the least environmentally sensitive location feasible and will avoid, to the greatest extent feasible, impacts on covered species and sensitive natural communities such as wetlands. Alignments will follow existing roads, easements, rights-of-way, and disturbed areas as appropriate to minimize additional habitat fragmentation. The footprint of disturbance will be minimized to the maximum extent practicable. - Equipment storage, fueling, and staging areas will be sited on disturbed areas or on ruderal or non-sensitive nonnative grassland land cover types, when these sites are available, to minimize risk of direct discharge into riparian areas or other sensitive land cover types. - Project surveys, including land cover mapping, will be conducted during the conceptual planning stage of each project (i.e., well in advance of project design) so that the results can inform the siting and design process. Project surveys should be conducted in as wide a study corridor as possible to enable project siting to minimize environmental impacts. - All planning survey requirements of this Plan will be followed within the construction corridor (i.e., the limit of project construction plus equipment staging areas and access roads) and the entire road right-of-way. Expanding the survey area beyond the project footprint will help identify covered species and their habitats so that impacts on covered species that occur adjacent to the construction zone can be minimized. - For certain road projects, identified in Table 6-6 of the HCP, data collection will be required on wildlife movement through the road study corridor for at least one year prior to project design. Wildlife movement will be studied at the site to	Less than significant

Table S-1: Summary of Impacts and Mitigation

Impact	Mitigation Measures	Significance After Mitigation
	determine which species move across it, when they move, and, most importantly, which landscape features are most often used. These data will be used to select the most appropriate design requirements for the species and conditions unique to the site (see below). - Transportation project proponents will consult early with the HCP/NCCP Implementing Entity, CDFG, and USFWS on individual projects to ensure that conceptual designs (siting) and project designs (construction and staging areas) meet the terms of the HCP. Design Requirements for Wildlife Movement and Impact Minimization - Design requirements will be updated or changed by designs shown by the best available science to be more effective at facilitating safe wildlife movement across roads. The effectiveness of road crossings for wildlife is an active area of research, so frequent advances in design are expected throughout the permit term. Further, improvements will be design to be durable, simple, and require the least amount of routine maintenance possible to ensure long-term functionality. - Wildlife crossing needs will be assessed for each road project as a whole (for those projects subject to this provision, not by road segment, and for each wildlife species likely to need to cross the facility. Data will be collected on wildlife movements at the proposed project site for at least 1 year. These data will inform the design of wildlife movement structures suitable for the site and the species that use the area. - Road undercrossings will be constructed at frequent intervals to allow wildlife movement. A combination of large structures (bridges, large culverts, or large tunnels) spaced at greater intervals and small structures (small culverts or tunnels) spaced at frequent intervals will be used to accommodate a wide variety of wildlife species. However, placement of undercrossings in areas where wildlife are most likely to use them is more important than maintaining a certain frequency or spacing. Wildlife crossings that serve multiple species should be used whenever possible. Crossing facilities should be installed at known travel routes, natural pinch points, or other topographically appropriate locations to maximize the chance of use. Suitable areas may include stream crossings or natural drainages. Undercrossings should be placed at grade whenever possible to maximize their use by wildlife. - Bridges, viaducts, or causeways will be used for certain projects to provide the most natural passageways for wildlife (i.e., to allow natural vegetation and physical features to occur in the undercrossing). If possible, bridges will span the bed and bank of streams and avoid or minimize bridge piers or footings within the stream, within bridge safety limits. If possible, the span of bridges that cross streams should also include some upland habitat beneath their spans to provide dry areas for wildlife species that do not use creeks or for use during storms. Native plantings, natural debris, or rocks should be installed under bridges to provide wildlife cover and encourage the use of crossings. - Large wildlife crossings (for medium to large mammals) will be placed approximately once every mile along new or substantially expanded roads that cross wildlife movement routes. Small wildlife crossings will be placed approximately every 1,000 feet along new or substantially expanded roads. This is the same interval of undercrossings suitable for California tiger salamander installed along Vasco Road in the inventory area (65 undercrossings in 13 miles). Within these parameters, undercrossings should be placed where wildlife are most likely to use them, rather than evenly spaced. The required interval can be used as an average if it can be demonstrated that strict adherence to the requirement will not benefit wildlife movement.	

Table S-1: Summary of Impacts and Mitigation

Impact	Mitigation Measures	Significance After Mitigation
	- Tunnels or culverts must be the minimum length, height, and width necessary to provide safe passage under the road. Culvert designs will be based on the best available data at the time. Current thinking recommends that culverts designed for medium-size mammals such as San Joaquin kit fox, coyote, raccoon, be 5–8 feet in diameter (although culverts larger than 8 feet in diameter may be needed for longer crossings). Culverts designed for small mammals are recommended at 18–48 inches in diameter; smaller structures may be preferred by smaller wildlife species. Culverts should, when feasible, provide a natural substrate on which wildlife can travel (e.g., open bottom). It is also recommended that wildlife undercrossings using tunnels or culverts use grating on the inactive part of the roadbed (e.g., road shoulders) to allow filtration of ambient light and moisture but minimize noise intrusion. Artificial lighting inside tunnels or culverts is not recommended; these devices have not been shown to be effective and may deter nocturnal wildlife. - Fencing will be used along the roadway to direct wildlife to undercrossings and minimize their access to the road (see Table 6-6 for applicability). Fencing designs will be customized for the wildlife expected to use the undercrossing and will be based on the best available data at the time. Fencing must be continuous along the road and must be attached to the undercrossing to facilitate its use. Fencing must also extend well beyond the target undercrossing to reduce the chance of wildlife moving around the fence. For example, four fencing designs have been installed along Vasco Road and monitored for their effectiveness in reducing mortality of California tiger salamanders. Fencing must be monitored regularly by the applicant and repairs made promptly to ensure effectiveness. Wildlife undercrossings must be at the same or similar elevation as the fencing (e.g., along elevated roadways) to increase chances of their use. Vegetation must be managed along small mammal and amphibian fencing to reduce the opportunity for these species to climb the fence. Fencing designed for small mammal or amphibian exclusion must be installed at least 8 inches deep into the soil to prevent small mammal burrows providing access under the fence. Where roads cross the wildlife exclusion fences, gates should be used whenever possible with material at the base of the gate to minimize the gap between the gate and the roadbed. If gates are not feasible, an in-roadway barrier (e.g., wildlife grates or similar devices) or device that channels species away must be installed to deter wildlife from moving around fences into the road. - When compatible with vehicle safety, road medians should allow wildlife to cross under or over the median in the event they become trapped on the roadway.	
	Construction Requirements - The following measures are specifically required for rural road and transportation projects. Other conservation measures described in the ECCC HCP for covered activities also apply. - No erodible materials will be deposited into watercourses. Brush, loose soils, or other debris material will not be stockpiled within stream channels or on adjacent banks. - All no-take species will be avoided. - Construction activities will comply with the Migratory Bird Treaty Act and will consider seasonal requirements for birds and migratory non-resident species, including covered species. - Temporary stream diversions, if required, will use sand bags or other approved methods that minimize in-stream impacts and effects on wildlife. - Silt fencing or other sediment trapping method will be installed downgradient from construction activities to minimize the transport of sediment off site. - Barriers will be constructed to keep wildlife out of construction sites, as	

Table S-1: Summary of Impacts and Mitigation

Impact	Mitigation Measures	Significance After Mitigation
	appropriate. - Onsite monitoring will be conducted throughout the construction period to ensure that disturbance limits, BMPs, and Plan restrictions are being implemented properly. - Active construction areas will be watered regularly to minimize the impact of dust on adjacent vegetation and wildlife habitats, if warranted. - The following construction measure will be applied differently to each rural road project, as specified in Table 6-6 of the ECCC HCP. - Install sturdy lock-boxes for cameras at each large wildlife undercrossing to facilitate wildlife monitoring by the Implementing Entity. Boxes shall be designed for monitoring equipment to be used, include a removable door, and be prewired for electricity (solar, battery, or alternating current). This will provide for the least intrusive, most secure, most flexible, and most cost-effective way to monitor wildlife usage, while minimizing human impacts. Boxes will be mounted on adjustable pedestals to vary the height of the box to facilitate monitoring of target species of varying size. Post-construction Requirements - Roadside vegetation within the right-of-way and adjacent to HCP/NCCP Preserves or other open space areas will be controlled to prevent the spread of invasive exotic plants such as yellow star-thistle into nearby or adjacent preserves. - Vegetation and debris must be managed in and near culverts and under and near bridges to ensure that entryways remain open and visible to wildlife and the passage through the culvert or under the bridge remains clear. - Cut-and-fill slopes will be revegetated with native, non-invasive nonnative, or non-reproductive (i.e., sterile hybrids) plants suitable for the altered soil conditions. - All structures constructed for wildlife movement (tunnels, culverts, underpasses, fences) must be monitored at regular intervals and repairs made promptly to ensure that the structure is in proper condition. Implementation of this mitigation measure is expected to reduce potentially significant conflicts with ECCC HCP to a less-than-significant level.	
2.9-8 Transportation 2035 Plan projects, combined with forecast urban development, could contribute to the removal or fragmentation of habitat area.	Same as above.	Significant Cumulative Impact, Contribution Cumulatively Considerable
Visual Resources		
2.10-1 Transportation 2035 Plan projects could affect visual resources during their construction.	2.10(a) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce significant visual impacts that shall be considered by project sponsors and decision-makers may include programs for reducing the visibility of construction staging areas, for fencing and screening these areas with low contrast materials consistent with the surrounding environment, and for revegetating graded slopes and	Less than significant

Table S-1: Summary of Impacts and Mitigation

Impact	Mitigation Measures	Significance After Mitigation
	exposed earth surfaces at the earliest opportunity.	
2.10-2 Construction of certain Transportation 2035 Plan projects could adversely affect visual resources by adding or expanding transportation facilities in rural or open space areas, blocking public views, or changing the visual character and quality of designated or eligible State Scenic Highways.	2.10(b) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce significant visual impacts that shall be considered by project sponsors and decision-makers may include, but are not limited to, those described below. • Design projects to minimize contrasts in scale and massing between the project and surrounding natural forms and development. • Site or design projects to minimize their intrusion into important viewsheds; • Use see-through safety barrier designs (e.g. railings rather than walls) when possible; • Develop interchanges and transit lines at the grade of the surrounding land to limit view blockage wherever possible; • Contour the edges of major cut and fill slopes to provide a more natural looking finished profile and use natural shapes, textures, colors, and scale to minimize contrasts between the project and surrounding areas; • Design landscaping along highway corridors to add significant natural elements and visual interest to soften the hard edged, linear travel experience that would otherwise occur; • Complete design studies for projects in designated or eligible State Scenic Highway corridors. Consider the “complete” highway system and develop mitigation measures to minimize impacts on the quality of the views or visual experience that originally qualified the highway for Scenic designation.	Significant
2.10-3 The construction of soundwalls along freeways and arterials could significantly alter views.	2.10(c) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce significant visual impacts impacts associated with soundwalls that shall be considered by project sponsors and decision-makers may include, but are not limited to, those described below. • Develop new or expanded roadways below the grade of surrounding areas to minimize the need for tall soundwalls. • Use transparent panels to preserve views where soundwalls would block views from residences. • Use landscaped earth berm or a combination wall and berm to minimize the apparent soundwall height. • Construct soundwalls of materials whose color and texture complements the surrounding landscape and development. • Design soundwalls to increase visual interest, reduce apparent height, and be visually compatible with the surrounding area. • Landscape the soundwalls with plants that screen the soundwall, preferably with either native vegetation or landscaping that complements the dominant landscaping of surrounding areas.	Less than significant

Table S-1: Summary of Impacts and Mitigation

	<i>Impact</i>	<i>Mitigation Measures</i>	<i>Significance After Mitigation</i>
2.10-4	Concurrent implementation of the proposed Transportation 2035 Plan and regional and local land use plans would result in a cumulatively considerable change in the visual character of many areas in the region.	Mitigation Measures 2.10(a) through 2.10(c) also apply to this cumulative impact.	Significant Cumulative Impact, Contribution Cumulatively Considerable

Cultural Resources

2.11-1	Transportation 2035 Plan projects that involve ground-disturbing activities and/or the introduction or alteration of visual elements have the potential to disturb, destroy, or significantly affect archaeological, paleontological, and/or geological resources and/or human remains.	2.11(a) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce impacts on archaeological, paleontological, and/or geological resources and/or human remains that shall be considered by project sponsors and decision-makers may include, but are not limited to, those described below. • Face-to-face consultation with Native American tribes and individuals with cultural affiliations where the project is proposed to determine the potential for, or existence of, cultural resources, including cemeteries and sacred places, prior to project design and implementation stages. • Preparation of a research design and testing plan in advance of implementation of the construction project, in order to efficiently facilitate the avoidance of cultural sites throughout the development process. • Written assessment by a qualified tribal representative of sites or corridors with no identified cultural resources but which still have a moderate to high potential for containing tribal cultural resources. • Upon "late discovery" of prehistoric archaeological resources during construction, project sponsors shall consult with the Native American tribe as well as with the "Most-Likely-Descendant" as designated by the Native American Heritage Commission pursuant to PRC 5097. • Preservation in place; this is the preferred manner of mitigating impacts to archeological sites because it maintains the relationship between artifacts and the archeological context, and it may also avoid conflict with religious or cultural values of groups associated with the site. This may be achieved through incorporation within parks, green-space, or other open space by re-designing project using open space or undeveloped lands. This may also be achieved by following procedures for capping the site underneath a paved area. When avoiding and preserving in place are infeasible, a data recovery plan may be prepared according to CEQA Section 15126.4. A data recovery plan consists of: the documentation and removal of the archeological deposit from a project site in a manner consistent with professional (and regulatory) standards; the subsequent inventorying, cataloguing, analysis, identification, dating, and interpretation of the artifacts; and the production of a report of findings.	Less than significant
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Table S-1: Summary of Impacts and Mitigation

	<i>Impact</i>	<i>Mitigation Measures</i>	<i>Significance After Mitigation</i>
2.11-2	Transportation 2035 Plan projects have the potential to disturb or destroy historical resources.	2.11(b) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce impacts on historical that shall be considered by project sponsors and decision-makers may include, but are not limited to, those described below. • Assessment by a qualified professional of structures greater than 40 years in age within the area of potential effect to determine their eligibility for recognition under State, federal, or local historic preservation criteria. • The treatment of identified historic resources in accordance with either the Secretary of the Interior's <i>Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings</i> or <i>Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings</i>.	Less than significant
2.11-3	Transportation 2035 Plan projects, combined with projected future population growth and development, may result in a cumulative disturbance of cultural resources.	Mitigation measures 2.11(a) and 2.11(b).	Significant Cumulative Impact, Contribution Not Cumulatively Considerable

1.1 Introduction, Organization, and Study Approach

The project description and study approach have been presented in which it was stated that the project description and study approach will be presented in the following sections. The project description and study approach will be presented in the following sections.

Part One Introduction and Project Description

The project description and study approach have been presented in which it was stated that the project description and study approach will be presented in the following sections. The project description and study approach will be presented in the following sections.

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PURPOSE OF THE EIS

The purpose of the EIS is to provide information to the public and to the decision makers regarding the proposed project and its potential impacts. The EIS is a process that is used to evaluate the potential impacts of a proposed project on the environment. The EIS is a process that is used to evaluate the potential impacts of a proposed project on the environment. The EIS is a process that is used to evaluate the potential impacts of a proposed project on the environment.

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I.I Introduction, Organization, and Study Approach

This program Environmental Impact Report (EIR) has been prepared on behalf of the Metropolitan Transportation Commission (MTC) in accordance with the California Environmental Quality Act (CEQA). This EIR analyzes the potential significant impacts of the adoption and implementation of the proposed Transportation 2035 Plan for the San Francisco Bay Area.

MTC AND THE TRANSPORTATION 2035 PLAN

MTC is the transportation planning, coordinating, and financing agency for the nine-county San Francisco Bay Area. Created by the State Legislature in 1970, MTC functions as both the regional transportation planning agency (RTPA)—a state designation—and for federal purposes as the region's metropolitan planning organization (MPO). MTC is required by State legislation (Government Code Section 65080 et. seq.) and by federal regulation (Title 23 USC Section 134) to prepare the Regional Transportation Plan (RTP) for the San Francisco Bay Area. This RTP is known as the *Transportation 2035 Plan*.

Simply put, the RTP is a long-range plan that specifies the strategies and investments to maintain, manage, and improve the region's transportation network – which includes bicycle and pedestrian facilities, local streets and roads, public transit systems, and highways. The RTP must span a period of at least 20 years into the future.

While MTC, along with other regional agencies, prepares Regional Airport and Seaport plans, the projects in these advisory plans do not require MTC funding or approvals. As such, these plans are separate from the proposed Transportation 2035 Plan and are subject to separate environmental review processes. Therefore, this EIR does not analyze the environmental effects of these plans.

PURPOSE OF THE EIR

This environmental assessment of the proposed Transportation 2035 Plan fulfills the requirements of CEQA and is designed to inform decision-makers, responsible and trustee agencies, and the general public of the proposed action and the range of potential environmental impacts of that action. The EIR recommends measures to mitigate significant adverse regional impacts identified in the analysis of the proposed Transportation 2035 Plan. The EIR process provides an opportunity to identify environmental benefits of the proposed Transportation 2035 Plan that might balance some potentially significant adverse environmental impacts. This EIR also analyzes alternatives to the proposed Plan. The final EIR will include a Mitigation Monitoring Program that identifies who will be responsible for implementing the measures. As the lead agency for preparing this EIR, MTC will use it in its review of the proposed Transportation 2035 Plan prior to taking action on the Plan.

This EIR represents the best effort to evaluate the potential environmental effects of the proposed Transportation 2035 Plan given its long-term planning horizon. It can be anticipated that

conditions will change; however, the assumptions used are the best available at the time of preparation and reflect existing knowledge of patterns of development, travel patterns, mode of travel, and technological factors.

EIR SCOPE

The Transportation 2035 Plan EIR is a program EIR, as defined in Section 15168 of the CEQA Guidelines as: “[An EIR addressing a] series of actions that can be characterized as one large project and are related either: (1) Geographically; (2) A[s] logical parts in the chain of contemplated actions; (3) In connection with the issuance of rules, regulations, plans, or other general criteria to govern the conduct of a continuing program; or (4) As individual activities carried out under the same authorizing statutory or regulatory authority and having generally similar environmental impacts which can be mitigated in similar ways.”

Program EIRs can be used as the basic, general environmental assessment for an overall program of projects developed over the 25 year planning horizon. A program EIR has several advantages. First, it provides a basic reference document to avoid unnecessary repetition of facts or analysis in subsequent project-specific assessments. Second, it allows the lead agency to look at the broad, regional impacts of a program of actions before its adoption and eliminates redundant or contradictory approaches to the consideration of regional and cumulative impacts.

As a programmatic document, this EIR presents a region-wide assessment of the potential impacts of the proposed Transportation 2035 Plan. Where appropriate, it also provides a corridor-by-corridor or county-by-county assessment. However, it does not evaluate subcomponents of the proposed Transportation 2035 Plan nor does it assess project-specific impacts of individual projects, all of which are required to comply with CEQA and/or NEPA as applicable (See *Relationship to Other EIRs*).

As provided for in CEQA Guidelines, the focus of this EIR is on those environmental issues and concerns identified as possibly significant by MTC in its Notice of Preparation (see Appendix A). These issue areas of concern include:

- **Transportation:** How would the proposed Transportation 2035 Plan affect travel behavior and the performance of the Bay Area’s transit systems, surface streets and highways?
- **Air Quality:** What effect would the transportation investments in the proposed Transportation 2035 Plan have on regional air quality, particularly ground-level ozone, carbon monoxide, and particulate matter emissions?
- **Land Use, Housing, and Social Environment:** Would the proposed Transportation 2035 Plan convert significant amounts of prime agricultural lands from natural resource uses to transportation uses? Would the transportation projects and programs conflict with local plans? Would projects in the proposed Transportation 2035 Plan displace a large number of people, disrupt or displace businesses, or physically divide established communities?
- **Energy:** How would the proposed Transportation 2035 Plan affect energy use connected with construction of new projects and the operation of motor vehicles and transit?

- **Climate Change and Greenhouse Gases:** What effect would the transportation investments in the proposed Transportation 2035 Plan have on climate change and greenhouse gas emissions, and how might climate change affect the transportation network?
- **Noise:** Would there be significant changes in community noise levels resulting from increases in regional traffic, construction or operation of projects in the proposed Transportation 2035 Plan?
- **Geology and Seismicity:** Would construction of projects in the proposed Transportation 2035 Plan expose travelers or structures to greater risk of damage, injury, or loss of life due to earthquakes, landslides, or liquefaction?
- **Water Resources:** Would the proposed Transportation 2035 Plan significantly affect changes in absorption rates, drainage patterns, rates or quality of surface water runoff or increases in flooding within the region?
- **Biological Resources:** Would the proposed Transportation 2035 Plan have the potential to disturb or reduce important habitats for plant and animal species, especially rare and endangered species? Would transportation improvements in proposed Transportation 2035 Plan obstruct the migration and movement of species within their habitats? Would the Plan be consistent with adopted conservation plans?
- **Visual Resources:** Would transportation improvements in the proposed Transportation 2035 Plan obstruct regionally significant scenic views or create aesthetically displeasing views?
- **Cultural Resources:** Would transportation improvements in the proposed Transportation 2035 Plan lead to the destruction or damage of archaeological or historical resources within the region, both those that are identified and those yet to be discovered?

Impact areas not specifically discussed include recreation, utilities and service systems, public services, and hazardous materials. As indicated in the Notice of Preparation for the proposed Transportation 2035 Plan EIR, no significant impacts of regional importance are expected to occur in these areas. These impacts will be addressed in project-specific environmental documents.

EIR ORGANIZATION

EXECUTIVE SUMMARY

This EIR begins with an executive summary of the environmental analysis, which includes a review of the potentially significant adverse regional environmental impacts of the proposed Transportation 2035 Plan and the measures recommended to mitigate those impacts. The executive summary also indicates whether or not those measures mitigate the significant impacts to a less than significant level. Finally, the executive summary describes the alternatives and their merits as compared to the proposed Transportation 2035 Plan, and identifies the environmentally superior alternative among them.

PART ONE: INTRODUCTION AND PROJECT DESCRIPTION

Part One includes two chapters. Chapter 1.1 (this chapter) describes the relationship between the proposed Transportation 2035 Plan and the EIR, the organization of the EIR, and the basic legal requirements of a program level EIR. It discusses the level of analysis and the alternatives

considered as well as how this EIR is related to other environmental documents and the EIR's intended uses. Chapter 1.2 introduces the purpose and objectives of the proposed Transportation 2035 Plan and summarizes specific information to describe the proposed Transportation 2035 Plan and complete the EIR analysis. This includes a description of the existing project setting and an outline of the Bay Area's projected population and employment growth rates and development patterns through the 2035 planning horizon year. State and federal planning regulations guiding the development of the RTP are also described. Finally, this section introduces the proposed Transportation 2035 Plan, and maps and lists numerous major projects by corridor.

PART TWO: SETTINGS, IMPACTS, AND MITIGATION MEASURES

Part Two describes the existing physical and regulatory settings for each of the environmental issue areas analyzed in the EIR, the potential impacts of the proposed Transportation 2035 Plan on these environmental issue areas, and measures to mitigate the potential impacts identified. Each issue area is analyzed in a separate chapter. Each chapter is organized as follows:

- Environmental Setting (Physical and Regulatory);
- Significance Criteria;
- Method of Analysis;
- Summary of Impacts; and
- Impacts and Mitigation Measures.

PART THREE: ALTERNATIVES AND CEQA-REQUIRED CONCLUSIONS

Part Three includes a description of four alternatives to the proposed Transportation 2035 Plan and an assessment of their potential to achieve the objectives of the proposed Transportation 2035 Plan while reducing potentially significant adverse regional environmental impacts. Part Three also includes a comparison summary table of regional environmental impacts associated with the alternatives. As required by CEQA, an environmentally superior alternative is identified. Finally, Part Three includes an assessment of the impacts of the proposed Transportation 2035 Plan in several subjects areas required by CEQA, including:

- Significant irreversible environmental changes;
- Significant unavoidable impacts;
- Growth-inducing impacts;
- Cumulative impacts; and
- Impacts found to be not significant.

PART FOUR: BIBLIOGRAPHY AND APPENDICES

Part Four includes a bibliography and the EIR appendices. Appendix A includes the Notice of Preparation (NOP) of this EIR and Appendix B includes the comments received on the NOP and at the two scoping meetings. Appendix C includes detailed project lists for the proposed Transportation 2035 Plan and the four alternatives studied in the EIR. Finally, Appendix D includes a detailed description of the regulatory setting associated with biological resources and a

comprehensive list of special-status species in the Bay Area with the potential to occur in or near the transportation improvements proposed in the Transportation 2035 Plan.

NOTICE OF PREPARATION (NOP) AND PUBLIC SCOPING

NOP

CEQA regulations require an early and open process for determining the scope of issues that should be addressed prior to implementation of a proposed action. MTC initiated the scoping process on February 19, 2008. As required by CEQA, MTC sent a copy of the NOP to the State Clearinghouse within the California Office of Planning and Research. The Clearinghouse is responsible for monitoring compliance of state agencies in providing timely responses. The Clearinghouse assigned state identification number SCH# 2008022101 to this EIR. MTC also filed the NOP with the Association of Bay Area Governments Clearinghouse and county clerks in each of the nine Bay Area counties. MTC also posted the NOP on MTC's website (<http://www.mtc.ca.gov>). State and federal resource agencies, the Bay Area Partnership (which is comprised of representatives of congestion management agencies, transit operators, public works directors, and other state and federal governmental agencies) and interested individuals and organizations also were sent either copies of the NOP via certified mail or postcards in the mail.

The NOP provides formal notification to all federal, state, regional, and local agencies involved with funding or approval of the project, and to other interested organizations and members of the public, that an EIR will be prepared for the project. The NOP is intended to encourage interagency communication concerning the proposed action and to provide sufficient background information about the proposed action so that agencies, organizations, and individuals can respond with specific comments and questions on the scope and content of the EIR. A copy of the NOP is provided in Appendix A, and the written comments received during the 30-day NOP period are contained in Appendix B.¹

SCOPING MEETINGS

Consistent with CEQA, a public scoping meeting was held on March 10, 2008 during the day, and on March 13, 2008 in the evening, to solicit agency and public comments on the EIR. The meetings were held at the MTC offices in Oakland. In addition, in a letter in response to the NOP, the Federated Indians of Graton Rancheria requested a government-to-government consultation regarding the EIR and RTP. This meeting was held on March 21, 2008, at their offices in Rohnert Park and was attended by MTC and Caltrans. A summary of the scoping meetings that occurred during the NOP period is included in Appendix B.

The NOP and public scoping meetings also help to meet the SAFETEA (Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users) requirements pertaining to

¹ Though not received until October 2008, the NOP comment letter from the California Department of Justice Attorney General's Office is also included in Appendix B, and was carefully considered along with the rest of the NOP comments in the preparation of this EIR.

extensive consultation and public involvement in the development of the RTP. In particular, through the NOP and scoping process, resource agencies, public agencies, Tribal governments, transportation providers, and the public had an opportunity to provide some early input on environmental issues and concerns that could be addressed as part of the environmental assessment for the proposed Transportation 2035 Plan.

OTHER CONSULTATION EFFORTS

In the ongoing effort to provide consultation opportunities beyond the scoping period, MTC, in partnership with Caltrans District 4 and ABAG, held a tribal consultation meeting on October 3, 2008 to discuss transportation projects in the Transportation 2035 Plan. Following this meeting, the Federated Indians of Graton Rancheria requested a one-on-one follow-up consultation meeting with MTC, which was held on October 15, 2008.

Further, as required by SAFETEA, on November 12, 2008, MTC held an agency consultation meeting to discuss draft mitigations to which Federal, State, and Tribal, land management, wildlife, and regulatory agencies were invited. Agency representatives were asked to provide specific suggestions for mitigation measures that could be incorporated into the Draft EIR to reduce potentially significant impacts of the proposed Project. Representatives of seven agencies attended and provided suggestions, including the U.S. EPA, Caltrans District 4, U.S. Fish and Wildlife Service, California Coastal Commission, California Department of Conservation, San Francisco Bay Conservation and Development Commission, and Bay Area Air Quality Management District.

Additional information about MTC's comprehensive public involvement process for the Transportation 2035 Plan may be found in a series of reports prepared by MTC.²

EIR APPROACH

TIMEFRAME

For analytic purposes in this EIR, the year 2006 is the base year (existing conditions), while the year 2035 is the horizon year (future conditions) when the proposed Transportation 2035 Plan will be fully implemented. The base year of 2006 corresponds to the year of the travel model validation conducted by MTC, and thus, represents the latest validated existing transportation network for the region. In cases where 2006 data is not available, the default is to use the latest known data to depict the baseline (i.e., existing conditions). The proposed Transportation 2035 Plan covers approximately a 25-year planning period, and the year 2035 represents the last year of the plan when projects/programs are anticipated to be fully implemented.

²For details on MTC's public outreach and involvement program for the Transportation 2035 Plan, see also MTC's Public Participation Plan (September 2007), MTC's Draft Public Outreach & Involvement Program (December 2008), and MTC's Government-to-Government Consultation with Native American Tribes (March 2009).

LEVEL OF ANALYSIS

This EIR focuses primarily on regional impacts, but also addresses transportation corridor impacts for a number of the environmental issue areas. MTC has defined 14 multi-modal travel corridors in recognition of their primacy as determiners of regional travel patterns. Where project level information is available, these impacts are discussed in as much as they may individually or cumulatively contribute to regional impacts (this would be verified in subsequent project-level environmental documents). Many of the projects evaluated in the Transportation 2030 Plan are carried forward to the proposed Transportation 2035 Plan. Refer to Chapter 1.2 and Appendix C for a more detailed description of corridors and projects.

TYPES OF IMPACTS

According to CEQA Guidelines, the following general types of environmental impacts need to be considered:

- **Direct or primary impacts**, which are caused by the project and occur at the same time and place as the project.
- **Indirect or secondary impacts**, which are caused by the project and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect or secondary impacts may include growth-inducing impacts and other impacts related to induced changes in the pattern of land use, population density, or growth rate, and related impacts on air and water and other natural systems, including ecosystems. Indirect or secondary impacts may also include cumulative impacts.
- **Short-term impacts**, which are those of a limited duration, such as the impacts that would occur during the construction phase of a project.
- **Long-term impacts**, which are those of greater duration, including those that would endure for the life of a project and beyond.
- **Significant unavoidable impacts**, which cannot be mitigated to a level that is less than significant.
- **Irreversible environmental changes**, which may include current or future irretrievable commitments to using non-renewable resources, or growth-inducing impacts that commit future generations to similar irretrievable commitments of resources. Also, irreversible change can result from risks of accidents and injury associated with the project.
- **Cumulative impacts that include two or more individual impacts which**, when considered together, are considerable or which compound or increase other environmental impacts. The individual impacts may be changes resulting from a single project or a number of separate projects. The cumulative effect from several projects is the change in the environment that results from the incremental effect of the project when added to other closely related past, present, and reasonably foreseeable future projects. Cumulative impacts can result from individually minor, but collectively significant, projects taking place over a period of time.

As a program-level EIR, individual transportation project impacts are not addressed in detail; rather the focus of this EIR is to address the impacts of a program of projects, which, individually or in the aggregate, may be regionally significant. For example, the physical impacts of major regional transportation expansion projects are addressed, while potential impacts to specific

wetlands or a specific species habitat by an individual interchange reconstruction project would not be discussed, unless information currently exists or it can be surmised that the effect would be large or otherwise regionally significant. This approach does not relieve local jurisdictions of the responsibility for evaluating project-specific, locally significant impacts. All impacts of individual projects will be addressed in future corridor transportation studies and project specific EIRs/EISs as required under CEQA and/or NEPA as applicable.

NO PROJECT VS. PROPOSED PROJECT COMPARISON

In addition to assessing the impacts of the proposed Project relative to existing conditions (as required by CEQA), a comparison is also made between the impacts of the proposed Project and the likely foreseeable future condition if the proposed Project were not implemented (this is called the No Project alternative). This is accomplished by evaluating impacts of both the No Project and Proposed Project in 2035, the horizon year for the proposed Transportation 2035 Plan. The No Project and proposed Project comparison also helps differentiate the proposed Transportation 2035 Plan impacts from the cumulative population and employment growth impacts that would affect travel demand on the regional transportation system and which are largely independent from proposed Transportation 2035 Plan policies and investments.

ALTERNATIVES

CEQA requires EIRs to evaluate a reasonable range of alternatives to the proposed Project that could feasibly attain most of the basic project objectives and would avoid or substantially lessen any of the significant environmental impacts. This EIR will evaluate the four alternatives briefly described below:

- **Alternative 1: No Project.** This alternative addresses the effect of not implementing the proposed Transportation 2035 Plan. This includes a set of transportation projects and programs that are in advanced planning stages and slated to go forward since they have full funding commitments. These projects are: (1) identified in the 2009 Transportation Improvement Program, (2) fully funded transportation sales tax projects authorized by voters, and/or (3) fully funded transportation projects as defined by federal/state statute or MTC policy.
- **Alternative 2: Heavy Maintenance/Climate Protection Emphasis.** This alternative represents only the set of transportation projects and programs that would be funded through revenues projected to be reasonably available over the next 25-year planning horizon of Transportation 2035. Unlike the proposed Project, this alternative shifts its investment emphasis towards transit and local roadway maintenance shortfalls and pedestrian, bicycle, rideshare, lifeline, and climate projects that may reduce vehicle miles traveled or greenhouse gas emissions. Expansion projects, including the Regional HOT Network, that are included in the proposed Project would not be funded under this alternative.
- **Alternative 3: Heavy Maintenance/Climate Protection Emphasis + Pricing Strategies.** This alternative reflects the same project definition as Alternative 2 plus examines the level of impact that user-based pricing strategies could have on the performance of the infrastructure investments. The pricing strategies are intended to induce changes in travel behavior by increasing the cost of driving.

- **Alternative 4: Heavy Maintenance/Climate Protection Emphasis + Land Use Strategies.** This alternative reflects the same project definition as Alternative 2 plus evaluates the impact that an alternative land use forecast might have on the performance of the infrastructure investment. ABAG staff produced this aggressive alternative land use strategy with the objective of balancing jobs and housing and targeting growth in existing communities and near transit.

See *Chapter 3.1* for more details about the alternatives.

CUMULATIVE IMPACTS ASSUMPTIONS

Due to the size of planning area, this EIR uses a regional projections approach to assess the cumulative impacts of the proposed Transportation 2035 Plan. The EIR distinguishes between the impacts of the proposed Transportation 2035 Plan investment program and the independent impacts of forecasted future population and employment growth, together with assumptions about where this growth will occur, which the proposed Transportation 2035 Plan projects and programs will serve. Thus, as required by statutes, MTC's travel projections for the proposed Project are based on the regional growth projections prepared by the Association of Bay Area Governments (ABAG). The most recent adopted forecast is used in this EIR: *Projections 2007*. Notably, the transportation, air quality, energy, and climate change and greenhouse gas analyses of the proposed Transportation 2035 Plan are largely cumulative impact analyses.

Some impacts on the environment will occur for reasons unrelated to the proposed Transportation 2035 Plan investment program. For instance, population in the Bay Area is forecast to increase due primarily to rising fertility rates resulting in increases in births, increased life expectancy, as well as migration attributed to the Bay Area economic base and quality of life.

RELATIONSHIP TO OTHER EIRS

This EIR has updated the description, analysis, and conclusions contained in earlier EIRs, including the Draft and Final EIRs prepared for the Transportation 2030 Plan.

As a program EIR, the preparation of this document does not relieve the sponsors of the projects listed in the proposed Transportation 2035 Plan from the responsibility of complying with the requirements of CEQA and/or NEPA for projects requiring federal funding or approvals. As noted, individual projects are required to prepare a more precise, project-level analysis to fulfill CEQA and/or NEPA requirements. The lead agency responsible for reviewing these projects shall determine the level of review needed, and the scope of that analysis will depend on the specifics of the particular project. These projects may, however, use the discussion of regional impacts in this EIR as a basis of their assessment of these regional or cumulative impacts.

INTENDED USES OF THE EIR

The CEQA Guidelines (Section 15124(d)) require EIRs to identify the agencies that are expected to use the EIR in their decision-making, and the approvals for which the EIR will be used. MTC will use the EIR as part of its review and approval of the Transportation 2035 Plan. The lead agencies for projects analyzed in this program EIR may use it as the basis for their regional cumulative analysis of specific project impacts, together with the projected growth in the region.

Bay Area congestion management agencies (CMAs) may incorporate information provided in this EIR into future county transportation plans such as congestion management programs, countywide transportation plans, or county bike and pedestrian plans. Other agencies expected to use the EIR include: Caltrans, transportation authorities, transit providers in the region (such as BART, AC Transit, SamTrans, Vallejo Transit, WestCAT, Muni, Caltrain, ACE, Water Emergency Transit Authority, etc.), the Bay Conservation and Development Commission, Bay Area Air Quality Management District, ABAG, and cities and counties.

Mitigation measures described in this EIR may be incorporated into project-level environmental impact analyses by project sponsors or local agencies as appropriate to mitigate identified project-level impacts.

APPROVALS FOR WHICH THE EIR WILL BE USED

This EIR is being prepared for use by MTC in its review and approval of the proposed Transportation 2035 Plan. The EIR is intended to be solely used for the approval of the proposed Transportation 2035 Plan and should not be used for the approval of individual projects included in the Transportation 2035 Plan. However, information in this document can be referenced as applicable.

I.2 Overview of the Proposed Transportation 2035 Plan

The proposed Transportation 2035 Plan is the Regional Transportation Plan (RTP) prepared by the Metropolitan Transportation Commission, and is the proposed Project evaluated in full in this program-level EIR.

The proposed Transportation 2035 Plan represents a transportation blueprint of how the Bay Area will address its transportation mobility and accessibility needs over the next 25 years. The plan document presents the plan's purpose and goals, tracks trends and performance, details financial assumptions and plan expenditures, profiles key investments, and sets forth actions that the region would advocate for and pursue over the next several years. See MTC's Draft Transportation 2035 Plan (December 2008) for full details.

This chapter describes the regional setting, growth forecasts and regulatory framework to provide the context for the proposed Transportation 2035 Plan. This background information is followed by a description of the key elements of the proposed Transportation 2035 Plan, including the plan purpose and goals, finances, and investment strategy. Key infrastructure investments included in the proposed Transportation 2035 Plan are listed by travel corridor.

REGIONAL SETTING

The Bay Area region consists of nine counties: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma. In a ranking of primary census statistical areas, the San Jose-San Francisco-Oakland Combined Statistical Area (CSA) population was the sixth largest in the nation in 2007, behind New York, Los Angeles, Chicago, Washington-Baltimore-Northern Virginia, and Boston CSAs.^{1,2} At the start of 2008, the Department of Finance estimated the San Francisco Bay Area population at 7.3 million. According to ABAG's *Projections 2007*, only about 18 percent of the region's approximately 4.6 million acres of land is developed and 73 percent of this developed land is in residential use. Figure 1.2-1 illustrates the regional location of the Bay Area. The Bay Area transportation network includes interstate and state freeways, county expressways, local streets and roads, bike paths, sidewalks, and a wide assortment of transit technologies (heavy rail, light rail, intercity rail, buses, trolleys and ferries).

More information about the San Francisco Bay Area physical setting is provided by environmental issue area in the settings sections throughout *Part Two* of this EIR.

¹ A primary census statistical area is a census defined metropolitan region that is not a component of another census defined metropolitan region. In the United States, the 719 primary census statistical areas currently defined by the United States Census Bureau include all 123 Combined Statistical Areas (CSAs) and the 596 Core Based Statistical Areas (CBSAs) that are not a component of a Combined Statistical Area.

² United States Census Bureau, 2007.

Figure 1.2-1 Regional Setting



PROJECTED GROWTH

According to ABAG's *Projections 2007*, the five most populous counties in 2005, in descending order, were Santa Clara, Alameda, Contra Costa, San Francisco, and San Mateo, accounting for 82 percent of the region's population. Santa Clara County is the most populous county in the Bay Area and is home to about 26 percent of the region's residents. The county's largest city, San Jose, is also the largest city in the Bay Area with a population of 943,000, or about 13 percent of the region's residents in 2005.³ Currently, there are 15 cities in the Bay Area with more than 100,000 residents.⁴

The Bay Area's population increased by about 13 percent (760,000) from 1990 to 2000, while jobs increased by about 14 percent (430,000).⁵ Between 2000 and 2005, the Bay Area population increased by another 5 percent, while jobs actually declined by 7-8 percent due to an economic downturn brought on, in part, by the "dot com bust". The highest employment numbers in 2005 were in the same five counties, though in a slightly different order: Santa Clara, Alameda, San Francisco, Contra Costa, and San Mateo; together, they accounted for 83 percent of Bay Area jobs that year. Looking ahead to 2035, ABAG projects that the Bay Area's population will grow another 27 percent from the 2005 level (nearly 2 million more residents) and employment will increase by 52 percent (1.8 million additional jobs). Figures 1.2-2 and 1.2-3 illustrate these trends in population and employment growth from 2005 to 2035.

The Transportation 2035 Plan's assessment of future transportation conditions and the effect of proposed transportation improvements on mobility are based on ABAG's most recent growth projections—*Projections 2007*. These projections indicate population and economic growth that presage the need for ongoing improvements to the regional transportation system. Not only must work trips be accommodated, but this growth will increase trips of all types, including shopping trips, school trips, recreational trips, airport access trips, etc. More details are provided in the analyses contained in *Part Two*.

³ Association of Bay Area Governments, 2007.

⁴ Department of Finance, May 2008a.

⁵ 1990 Census; California Economic Development Department, 2008.

Figure 1.2-2: Population Growth by County (2005-2035)

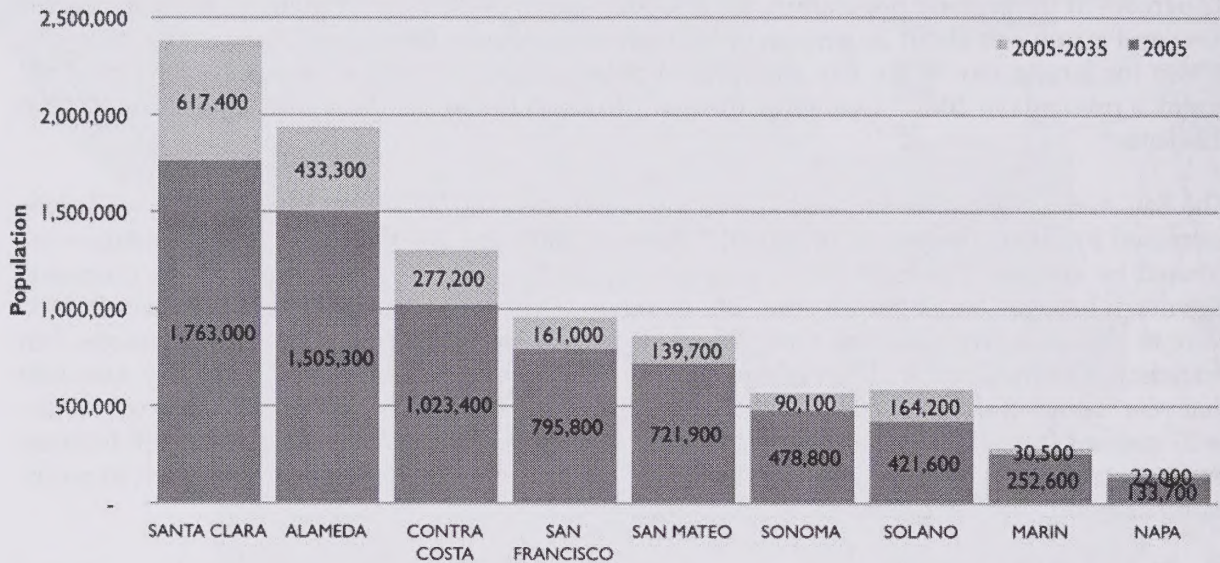
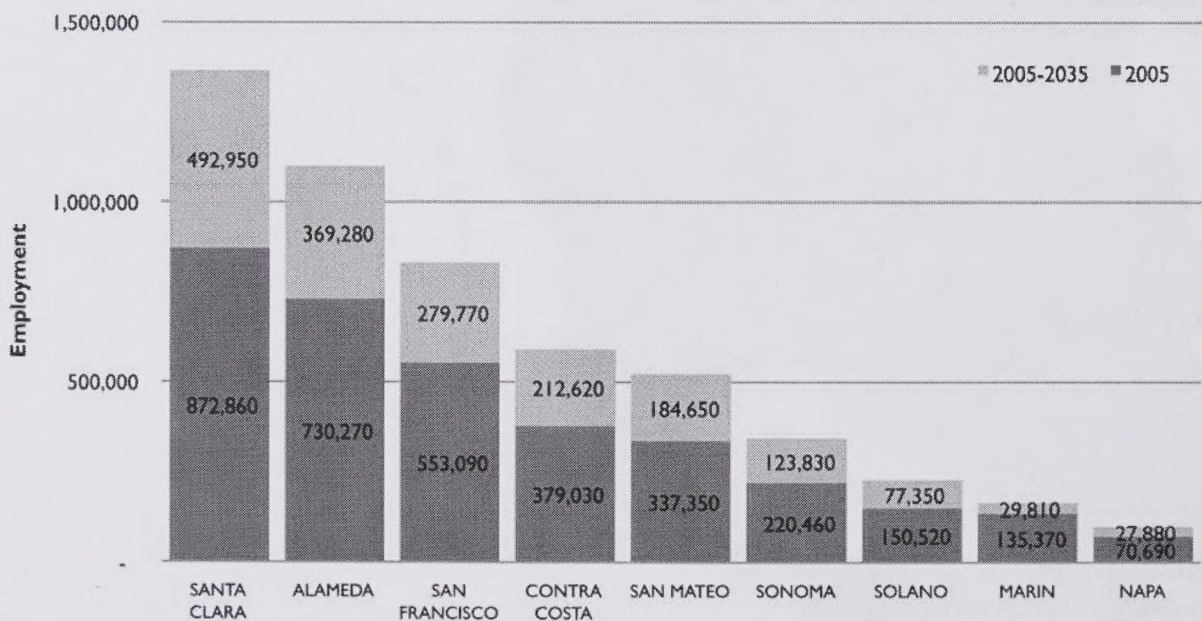


Figure 1.2-3: Employment Growth by County (2005-2035)



REGULATORY SETTING

FEDERAL

Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) was signed into law in 2005 and reauthorized highway, highway safety, transit, and other surface transportation programs for five years (2005-2009) totaling \$244.1 billion. Under SAFETEA, the U.S. Department of Transportation (USDOT) requires that Metropolitan Planning Organizations (MPOs), such as MTC, review and update the long-range transportation plan at least every four years in air quality nonattainment and maintenance areas and at least every five years in attainment areas.

MTC adopted the current RTP, which is referred to as the *Transportation 2030 Plan*, in February 2005. This proposed Transportation 2035 Plan represents the four year update to the current plan. The Bay Area is currently designated as a marginal nonattainment area of the national 8-hour standard (effective June 2004), which is the reason why MTC is preparing the four year update. Note that US EPA lowered the national 8-hour ozone standard from 0.80 to 0.75 parts per million (effective May 27, 2008), and so US EPA will issue final designations based upon the new national 8-hour standard by March 2010.

Metropolitan Transportation Planning Regulations

The primary federal requirements regarding RTPs are addressed in the metropolitan transportation planning rules in Title 23 of the Code of Federal Regulations (CFR) Part 450 and 500 and Title 49 CFR Part 613. These federal regulations have been updated to reflect the metropolitan transportation planning regulations called out in SAFETEA-LU. These requirements call for the metropolitan transportation planning process to include the development of a transportation plan addressing no less than a 20-year planning horizon. The transportation plan shall include both long-range and short-range strategies/actions that lead to the development of an integrated multimodal transportation system to facilitate the safe and efficient movement of people and goods in addressing current and future transportation demand.

According to these requirements, the metropolitan transportation planning process shall be continuous, cooperative, and comprehensive, and provide for consideration and implementation of projects, strategies, and services that will address the factors listed below:

- Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency;
- Increase the safety of the transportation system for motorized and non-motorized users;
- Increase accessibility and mobility of people and freight;
- Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns;
- Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight;

- Promote efficient system management and operation; and
- Emphasize the preservation of the existing transportation system.

The degree of consideration and analysis of these factors should be based on the scale and complexity of many issues, including transportation system development, land use, employment, economic development, human and natural environment, and housing and community development. MTC considered these planning factors in the preparation of the proposed Transportation 2035 Plan.

Further, federal regulations require RTPs to include, at a minimum, the following components:

- The projected transportation demand of persons and goods in the metropolitan planning area over the period of the transportation plan;
- Existing and proposed transportation facilities (including major roadways, transit, multi-modal and intermodal facilities, pedestrian walkways and bicycle facilities, and intermodal connectors) that should function as an integrated metropolitan transportation system, giving emphasis to those facilities that serve important national and regional transportation functions over the period of the transportation plan;
- Operational and management strategies to improve the performance of existing transportation facilities to relieve vehicular congestion and maximize the safety and mobility of people and goods;
- Consideration of the results of congestion management process;
- Assessment of capital investment and other strategies to preserve the existing and projected future metropolitan transportation infrastructure and provide for multimodal capacity increases based on regional priorities and need;
- Design concept and design scope descriptions of all existing and proposed transportation facilities in sufficient detail;
- Discussion of types of potential environmental mitigation activities and potential areas to carry out these activities;
- Pedestrian walkway and bicycle transportation facilities;
- Transportation and transit enhancement activities, as appropriate; and
- Financial plan that demonstrates how the adopted transportation plan can be implemented.

STATE

California Government Code Section 65080 sets forth the requirements for RTPs. Section 65080 requires MPOs located in air quality nonattainment regions update their RTPs at least every four years.

Regional Transportation Plan (RTP) Guidelines

The RTP Guidelines adopted by the California Transportation Commission (CTC) state that the CTC cannot program projects that are not identified in the RTP. Section 65080 states that the RTP shall contain three distinct elements:

- A **Policy Element** that reflects the mobility goals, policies and objectives of the region;
- An **Action Element** that identifies programs and actions to implement the RTP; and
- A **Financial Element** that summarizes the cost of implementing the projects in the RTP in a financially constrained environment.

The proposed Transportation 2035 Plan covers all appropriate issues associated with each element. The proposed Transportation 2035 Plan also serves all the specific planning purposes outlined in the CTC RTP Guidelines, including⁶:

- Providing an assessment of the current modes of transportation and the potential of new travel options within the region;
- Forecasting the future needs for travel and goods movement;
- Identifying specific actions necessary to address the region's mobility and accessibility needs;
- Identifying public policy decisions by local, regional, state and federal officials regarding transportation expenditures and financing;
- Identifying needed transportation investments, in sufficient detail, to serve as a foundation for the development of the Federal Transportation Improvement Program (TIP), the Interregional Transportation Improvement Program (ITIP), and facilitation of the NEPA/404 integration process, and identification of project purpose and need;
- Using performance measures that demonstrate the effectiveness of the transportation improvement projects in meeting the intended goals;
- Promoting consistency between the California Transportation Plan, the regional transportation plan and other plans developed by cities, counties, Native American Tribal Governments, and State and Federal agencies;
- Providing a forum for participation and cooperation and facilitation of partnerships that reconcile transportation issues which transcend regional boundaries; and
- Involving numerous stakeholders such as community-based organizations, Native American Tribal Governments, local elected officials, and Federal, State and local agencies early in the transportation planning process.

Transportation Improvement Program (TIP)

Once adopted, the RTP guides the development of the Transportation Improvement Program (TIP) for the region. The TIP is a comprehensive listing of all Bay Area transportation projects that receive federal funds or that are subject to a federally required action. The TIP sets forth MTC's investment priorities for transit and transit-related improvements, highways and roadways, transit, and other surface transportation improvements. MTC prepares and adopts the TIP every two years. The TIP covers at least a four-year period and contains a priority list of projects

⁶ See California Transportation Commission's 2007 Regional Transportation Plan Guidelines.

grouped by year. Further, the TIP is also financially constrained by year (meaning that the amount of dollars programmed must not exceed the amount of dollars estimated to be available). Each project or project phase included in the TIP must be consistent with the approved transportation plan.

MTC's own enabling statutes (State Government Code Section 66508 through Section 66513) reflect the federal and state requirements for preparation of a RTP.

PROPOSED PROJECT: TRANSPORTATION 2035 PLAN

The proposed Transportation 2035 Plan represents the transportation policy and action statement of how the Bay Area will approach the region's transportation needs over the next 25 years. It was prepared by MTC in partnership with ABAG, Bay Area Air Quality Management District (BAAQMD), and Bay Conservation and Development Commission (BCDC) and in collaboration with Caltrans, nine county-level Congestion Management Agencies (CMAs), over two dozen Bay Area transit operators, and numerous transportation stakeholders and the public.

PURPOSE AND GOALS

At the core of the proposed Transportation 2035 Plan is a vision of what the Bay Area transportation network should look like in 2035. The purpose and goals of the proposed Transportation 2035 Plan provide the framework for this vision. The purpose of the proposed Transportation 2035 Plan is to encourage and promote the safe and efficient management, operation and development of a regional intermodal transportation system that will serve the mobility needs of people and goods. The Commission adopted the following Statement of Vision for the proposed Transportation 2035 Plan:

"Transportation 2035 *is* change in motion. Guided by the Three Es of sustainability—economy, environment, and equity—the plan's ambitious goals and performance objectives, that will transform not only the way we invest in our transportation but the very way the Bay Area travels. The plan sets forth a bold vision and takes us on a journey to:

"Where mobility and accessibility is ensured for all Bay Area residents and visitors, regardless of race, age, income or disability;

"Where our bicycle and pedestrian facilities, public transit systems, local streets and roads, and highways are all safe and well-maintained and take us when and where we need to go;

"Where an integrated, market-based pricing system for the region's carpool lanes (via a Regional High-Occupancy Toll (HOT) Lane Network), bridges, and roadways helps us not only to manage the demand on our mature transportation system but also to pay for its improvements;

"Where our lively and diverse metropolitan region is transformed by a growth pattern that creates complete communities with ready, safe and close access to jobs, shopping, and services that are also connected by a family of reliable and cost-effective transit services;

“Where technology advances move out of the lab and onto the street, including clean fuels and vehicles, sophisticated traffic operations systems to manage traffic flow and reduce delay and congestion on our roadways, advanced and accessible traveler information that allows us to make informed travel choices, and transit operational strategies that synchronize fare structures, schedules, and routes to speed travel to our destinations;

“Where we have a viable choice to leave our autos at home and take advantage of a seamless network of accessible pedestrian and bicycle paths that connect to nearby bus, rail and ferry services that can carry us to work, school, shopping, services, or recreation;

“Where we lead and mobilize a partnership of regional and local agencies, businesses, and stakeholders to take effective action to protect our climate and serve as a model for national and international action;

“Where our transportation investments and travel behaviors are driven by the need to reduce our impact on the earth’s natural habitats; and

“Where all Bay Area residents enjoy a higher quality of life.”

The Commission approved the following plan goals for the proposed Transportation 2035 Plan based on input received from partner agencies, the public and transportation stakeholders (see Table 1.2-1). The plan goals are not entirely confined to any one of the Three Es, but rather cut across and reinforce all three principles.

Table 1.2-1: Three E Principles and Goals

Principle	Goal
Economy	Maintenance & Safety
	Reliability
	Efficient Freight Travel
	Security & Emergency Management
Environment	Clean Air
	Climate Protection
Equity	Equitable Access
	Livable Communities

For the proposed Transportation 2035 Plan, the Commission reaffirmed and carried forward the six goals from the Transportation 2030 Plan for purposes of keeping the planning effort focused and staying consistent from plan to plan, and because the 2030 goals had a strong basis in public input. For 2035, the Commission added two new goals—Security & Emergency Management and Climate Protection—to be responsive to the changing environment and new planning factors established in the SAFETEA-LU metropolitan planning regulations.

In April 2007, MTC discussed the plan goals with the public, Partnership Technical Advisory Committee (TAC), MTC advisory committees, Joint Policy Committee (JPC), and MTC Planning committee for review and comment. MTC received numerous comments including making the climate protection goal more action-oriented, emphasizing that equity not only supports the Access to Mobility goal but all other goals, and adding a new goal to address economic vitality. In

response to those comments, MTC proposed a new policy framework centered on the three principles of economy, environment and equity (also known as the Three Es). The Three Es are the same ones used by smart growth planning efforts, funded around the state by the California Business, Housing, and Transportation Agency. These efforts include the Bay Area's FOCUS program. For a prosperous economy, the featured goals are safety, security, reliability and efficient freight. For a quality environment, the clean air and climate change goals are the anchors. And lastly, for social equity, the access to mobility and livable communities goals help to advance equitable opportunities and benefits for all Bay Area residents.

The proposed Three E principles and goals for the Transportation 2035 Plan were subjected to considerable outreach to partner agencies and the general public. In June 2007, MTC staff circulated the draft goals for review and comment by the Bay Area Partnership, Joint Policy Committee, Planning Committee, MTC advisory committees and the general public through three "Early Dialogue" workshops. The Commission approved the Three Es and goals for the proposed Transportation 2035 Plan in July 2007 (as shown in Table 1.2-1).

KEY PLAN COMPONENTS

If the purpose and goals are the framework for the vision, the key plan components—performance objectives, finance plan, and investment strategy—provide the content behind the framework and vision. The following sections provide a brief summary of the decision-making process that led to the selection of performance objectives and the project investment strategy. See MTC's Draft Transportation 2035 Plan (December 2008) for full details.

Defining Performance Objectives

In July 2007, Commission gave direction to staff to proceed with a performance-based approach to develop the Transportation 2035 vision. MTC began by defining ambitious performance-based "targets" for each of the Three Es, taking the lead on these metrics from state plans and legislation where possible. These targets are not the sole objectives for the Transportation 2035 Plan, but rather they serve as guideposts that allow MTC to test—through models and other analytic tools—what it may take to shape the Transportation 2035 vision. Table 1.2-2 presents the preliminary performance targets approved by the Commission for analytic purposes.

Table 1.2-2: Preliminary Performance Targets

	Focus Area	Performance Target
Economy	Congestion: In poll after poll, traffic congestion is the top concern of Bay Area residents. The Bay Area has the second worst congestion in the nation and commuters spend an average of 72 hours a year in traffic. Yet past plans show little progress in taming congestion.	Reduce person hours of delay by 20 percent below today's levels <i>Source: Governor's Strategic Growth Initiative</i>
	Carbon Dioxide and Particulate Matter: The transportation sector contributes 40 to 50 percent of greenhouse gas emissions in the Bay Area and reducing these emissions will be critical for achieving the reductions required by state law. Particulate matter emissions are demonstrated to pose a serious health risk. U.S EPA lowered the 24-hour PM _{2.5} standard from 65 µg/m ³ to 35 µg/m ³ in 2006. EPA is required to designate the attainment status of BAAQMD for the new standard by December 2009.	Reduce CO ₂ emissions by 40 percent below 1990 levels <i>Source: California Global Warming Solutions Act of 2006 and Governor's Strategic Growth Initiative</i>
Environment	Vehicle Miles Traveled: There is a strong correlation between VMT and harmful vehicle emissions, including carbon dioxide and particulate matter.	Reduce PM _{2.5} emissions by 10 percent below today's level and PM ₁₀ by 45 percent from today Reduce VMT per capita by 10 percent compared to today <i>Source: SB 375 (Steinberg), prior to amendment and passage</i>
	Access, Public Health, and Cost: Recent discussions highlight equity as a crosscutting concern underlying all the Transportation 2035 Plan goals. These areas arise as especially pressing: access to opportunities, exposure to transportation-related health risks, and transportation cost.	Decrease by 10 percent the combined share of low-income and lower-middle income residents' household income consumed by transportation and housing
Equity		

To understand how transportation system expansion and enhancement contribute toward the targets, MTC evaluated three modally-based⁷ investment scenarios. Because this was a visioning exercise, the scenarios were designed to be distinct enough to reveal differences in performance and were not constrained to expected revenues. The scenarios tested were as follows:

- **Freeway Performance:** operational strategies such as ramp metering and limited capacity expansion such as HOV lanes as defined through MTC's Freeway Performance Initiative;
- **High-Occupancy/Toll (HOT) Lanes/Express & Local Bus Service:** based on the Regional HOT Lanes Study⁸ with complementary express and local bus enhancements; and
- **Rail & Ferry:** based on the Regional Measure 2-mandated Regional Rail Plan and the Water Transit Authority's Ferry Implementation and Operations Plan.

⁷ The investment scenarios were based on modes of transportation (e.g. private cars, on-road public transit, or rail and ferry services), as opposed to basing them on other frameworks, such as corridors (e.g. more investment in some corridors than others).

⁸ MTC's Bay Area HOT Network Study (December 2008)

MTC also conducted land use and pricing sensitivity analyses on the investment scenarios to see how demand-based strategies might help the region reach the targets. The land use strategy, developed in conjunction with ABAG, featured more focused residential growth than depicted in ABAG's adopted *Projections 2007*. The pricing sensitivity test included congestion pricing, higher gas prices, parking charges or transit fare discounts. The results of the vision scenario analysis were presented at the ABAG/MTC "Bay Area on the Move" summit in October 2007.

The scenario analysis helped the Commission to gauge whether the preliminary targets were achievable, what it would take to reach them, and what new authority, new partnerships, and new policies might be required to make progress towards them. MTC learned that infrastructure investments alone produce minimal tangible progress toward the targets, and that aggressive pricing and land use strategies exert much greater influence toward target achievement. MTC learned that it must also rely on technological innovations and behavior changes to make significant headway toward the targets.

Based upon the lessons learned from the vision scenario analysis, and support for a performance-based planning approach in general from the partners and the public, the Commission subsequently approved a final set of performance objectives, some of which will require actions outside of MTC's direct authority in order to achieve, but which were considered important to keep for planning purposes. In addition to those considered in the preliminary stage, the Commission added performance objectives specifically to improve maintenance and reduce collisions/fatalities. The performance objectives are all quantifiable measures against which progress may be evaluated (see Table 1.2-3).

In approving the performance objectives, the Commission stated that at its discretion, the Commission may change the performance objectives at any time to better align the objectives with Commission policy or respond to new circumstances. Importantly, the performance objectives do not constitute legal mandates, nor do they constitute thresholds of significance under CEQA; the significance criteria applied in this EIR are as described for each environmental issue area in *Part Two*.

Table 1.2-3: Approved Performance Objectives

	Goal	Performance Objectives
Economy	Maintenance & Safety	<i>Maintenance</i> • Maintain local road pavement condition index (PCI) of 75 or greater for local streets and roads • State highway distressed pavement condition lane-miles not to exceed 10% of total system • Achieve an average age for all transit asset types that is no more than 50% of their useful life • Increase the average number of miles between service calls for transit service in the region to 8,000 miles <i>Collisions/Fatalities</i> • Reduce fatalities from motor-vehicle collisions by 15 percent from today by 2035 • Reduce bicycle and pedestrian fatalities attributed to motor vehicle collisions by 25 percent each from 2000 by 2035 • Reduce bicycle and pedestrian injuries attributed to motor vehicle collisions by 25 percent each from 2000 by 2035
	Reliability; Efficient Freight Travel; Security & Emergency Management	• Reduce per-capita delay by 20 percent from today by 2035
Environment	Clean Air; Climate Protection	• Reduce daily per-capita vehicle miles traveled (VMT) by 10 percent from today by 2035 • Reduce emissions of finer particulates (PM_{2.5}) by 10 percent from today by 2035 • Reduce emissions of coarse particulates (PM₁₀) by 45 percent from today by 2035 • Reduce carbon dioxide (CO₂) emissions to 40 percent below 1990 levels by 2035
Equity	Equitable Access; Livable Communities	• Decrease by 10 percent the combined share of low-income and lower-middle income residents' household income consumed by transportation and housing

Project Selection Process

Following the vision scenario analysis and performance objectives refinement, in February 2008, MTC performed a detailed assessment of some 700 projects proposed for consideration in the financially constrained Transportation 2035 Plan. The two-part project assessments included a quantitative appraisal to measure benefit/cost with respect to the performance objectives, and a qualitative policy assessment to reflect the somewhat broader considerations embodied in the Three Es and plan goals. The purpose of the project-level assessment was to identify outliers—projects that most strongly support the plan's performance objectives and goals, and those that most obviously do not support the performance objectives and goals.

The Commission's intent was to include the highest-performing projects (those that both yield a high financial return for each dollar invested and address multiple goals), and to exclude the lowest-performing projects (those that cost more than the benefits produced and address only a few

goals.) High performers identified as a result of the performance assessment included investments such as the Freeway Performance Initiative, Regional HOT Network, and transit efficiency projects, while lower performers were found among some freeway and expressway widenings, freeway-to-freeway interchanges, and even regional programs like Lifeline Transportation Program and Transportation Climate Action Campaign.

Performance against goals and objectives was not the only factor; the Commission also considered input from transportation partners, stakeholders, and the public, in discussing the tradeoffs amongst competing priorities. The Commission ultimately considered both the performance results and partner/public input in deciding on the set of transportation projects to be included in the financially constrained element of the plan. (See projects listed by corridor at the end of this chapter.)

Finances

Forecasted Revenues

The proposed Transportation 2035 Plan is financially constrained, as defined in the past four plans, as a set of future transportation projects and programs that can be implemented with federal, state, regional, or local revenue projected to be reasonably available over the next 25 years. It also includes illustrative transportation projects that would have benefits if additional revenues were secured in the future. For the proposed Transportation 2035 Plan, MTC's financial assumptions are based upon an examination of the historical growth trends of traditional and non-traditional revenue sources and retrospective analyses of predecessor long-range plans.

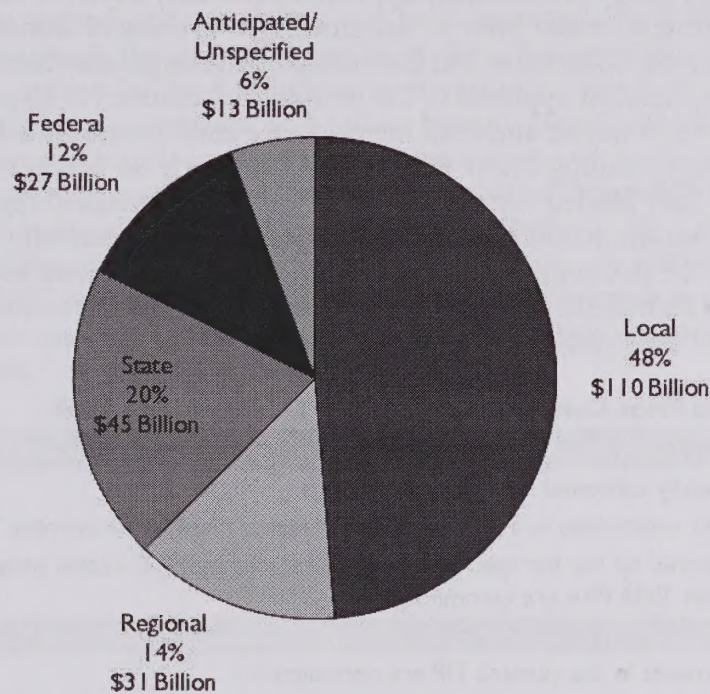
Total estimated revenue over the next 25 years amounts to \$226 billion (escalated dollars), and constitutes the financial resources available for the Plan. Nearly half of these funds come from local sources, primarily transit fares, dedicated sales tax programs, and county sales tax subventions to local streets and roads. The remainder is state and federal revenues, mainly derived from state gas taxes, and regional sources, mostly bridge tolls. For the first-time, MTC included "Anticipated/Unspecified" revenues in the financial assumptions as a way to strike a balance between the past practice of only including specific revenue sources currently in existence or statutorily authorized, and the more flexible federal requirement of including revenues that are "reasonably expected to be available" within the plan period. The Regional High-Occupancy/Toll (HOT) Network revenues are also included in the financial assumptions; they represent net revenues available for other investments after financing the completion of the Regional HOT Network and funding operations and maintenance costs over the 25-year period. Figure 1.2-4 shows the total 25-year projected revenues. See MTC's Draft Transportation 2035 Plan for more details about financial assumptions.

"Prior Commitments" Policy

MTC takes a 3-step process to separate out the funds with prior commitments from those over which it would have discretionary authority. The steps include (1) prepare the 25-year revenue forecasts (described above), (2) determine what funds are committed by MTC policy, and (3) subtract those committed funds from the total projected revenues in order to determine the balance that is subject to MTC discretion that can be allocated to new projects.

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Chapter 1.2: Overview of the Transportation 2035 Plan

Figure 1.2-4: Projected 25-Year Revenue Sources (Financially Constrained Element)



In January 2008, MTC staff requested the Commission revisit the prior commitments policy adopted for the Transportation 2030 Plan (MTC Resolution 3609) and consider setting a more restrictive policy on what is considered a prior commitment. Adopting a more restrictive policy would open up more funds for discretionary action. After receiving the staff report on the prior commitment policy and hearing public comments, the Commission provisionally approved a new prior commitments policy for the Transportation 2035 Plan. Table 1.2-4 shows the new prior commitment policy in comparison to the previous one adopted for the Transportation 2030 Plan.

Table 1.2-4: Comparison of “Prior Commitments” Policies

“Old” Transportation 2030 Plan Criteria	“New” Transportation 2035 Plan Criteria
Committed Funds	
Local transportation sales taxes are committed.	Locally generated or locally subvented funds are committed.
Transportation funds for operations and maintenance as programmed in the 2003 Transportation Improvement Program, specified by law, or defined by MTC policy are committed.	Transportation funds for operations and maintenance as programmed in the current Transportation Improvement Program, reserved by law for specific uses, or allocated by MTC action prior to the development of the Draft Transportation 2035 Plan are committed.
Committed Projects	
Projects with completed environmental document by May 2004 with committed construction funds or 66% non-discretionary funds are committed	Projects or project elements fully funded in the current TIP are committed Resolution 3434 Regional Transit Expansion Program represents the Commission’s transit expansion policy and is therefore committed
Regional programs with existing executed contracts are committed	Ongoing regional operations programs are committed

During June and July 2008, stakeholders and the public requested the Commission to reconsider the prior commitment policy provisionally approved in January 2008 for various reasons (including revisiting commitments made prior to the growing awareness of climate change and AB 32). At the July 2008 Planning Committee and Commission meetings, after hearing public comments, the Commission reaffirmed its approval of the new policy because: (1) 85 percent of the committed funds are dedicated to transit and road maintenance and operations, which is consistent with the Commission's long-standing Fix-It-First policy; (2) nearly 90 percent of the committed expansion projects are fully funded with mostly local funds or earmarked regional, state, or federal funds that MTC has no discretion to redirect to other uses; (3) a majority of these projects have progressed well into the development process, and (4) most committed projects support several Transportation 2035 Plan goals. The Commission adopted the prior commitment policy for the Transportation 2035 Plan in July 2008, defined in Table 1.2-5 below.

Table 1.2-5: Adopted Prior Commitment Policy MTC Resolution 3868

Committed Funds - \$191 billion in total⁹

Locally generated or locally subvented funds are committed

Transportation funds for operations and maintenance as programmed in the current TIP

Fund expenditures reserved by law for specific uses, or allocated by MTC action prior to the development of the Draft Transportation 2035 Plan are committed

Committed Projects

Projects or project elements in the current TIP are committed

Fully funded Resolution 3434 projects are committed

Ongoing regional operations programs are committed such as TransLink®, 511 traveler information, Regional Rideshare Program, Freeway Service Patrol/Call Boxes, Freeway Operations, and Transit Connectivity (up to \$10 million)

Investment Strategy

Financially Constrained Element

The total \$226 billion projected revenue is divided into two main funding categories: (1) "committed" revenues that are already committed by MTC Resolution 3868; and (2) uncommitted discretionary revenue for new projects and programs. Of the \$226 billion projected revenue, \$194 billion is committed. About \$165 billion is dedicated to maintaining and operating the existing regional transportation network – \$113 billion (58 percent) is for transit maintenance and operations and \$52 billion (27 percent) is for road maintenance and operations. This leaves \$29 billion committed to expansion of the regional transportation network – \$23 billion (12 percent) for transit expansion and \$3 billion for road/other expansion. For purposes of this EIR analysis, committed projects are evaluated as the No Project Alternative because these projects would otherwise occur, since they do not rely on future discretionary funding. All other project alternatives (including the proposed Project) include and thus "build upon" these committed projects.

⁹ In July 2008, the committed funds totaled \$191 billion; however, with the passage of Prop. 1A High-Speed Rail Bond, North Bay Measure Q for SMART, and Measure B Santa Clara County BART sales tax in November 2008, the committed funds increased by close to \$3 billion, revising the committed funds total to \$194 billion.

This leaves \$32 billion in uncommitted discretionary revenue for new projects, also known as “new commitments.” New commitment projects are so named because they require a new MTC commitment of future federal, state, regional, and local revenues which MTC forecasts will be reasonably available through the 25-year horizon of the Transportation 2035 Plan. Key new commitment projects funded by the \$32 billion in discretionary funds include: \$7.0 billion towards local road pavement maintenance; \$6.4 billion towards transit vehicle replacement and 25 percent of the highest-rated transit assets; \$6 billion for transit and roadway expansion projects; \$2.2 billion toward the Transportation for Livable Communities Program; \$1.6 billion toward the Freeway Performance Initiative; \$400 million towards the Regional Bicycle Network; and \$400 million toward the Lifeline Transportation Program. In addition, the plan includes the development of a Regional HOT Network¹⁰ that is projected to generate revenue of \$6.1 billion (net of operating, maintenance and capital expenditures) to implement other, as yet to be determined, corridor improvements.

¹⁰ The region has been incrementally constructing an HOV system over the past 30 years, which has been part of its ozone emission reduction strategy. The Transportation 2035 Plan proposes to convert this existing and planned Bay Area HOV system to a Regional HOT Network that would allow the system to be built out 20 years faster and provides a reliable travel option can be made available to commuters using the state highway system.

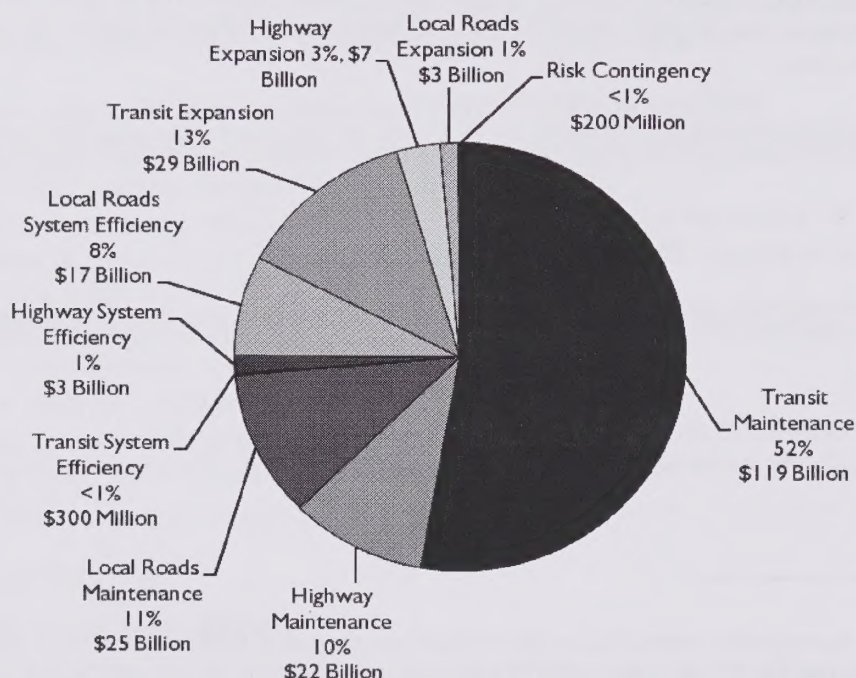
MTC has completed an initial feasibility study (included as appendix to the Plan, and incorporated herein by reference) that suggests the region's HOV system can incorporate HOT lane functions and continue to offer priority for carpoolers and express buses, while improving overall freeway efficiency over a 30-year period if developed and financed as a regional system rather than a corridor-by-corridor endeavor. Current state law currently only provides for a governance framework on a limited number of corridors rather than a truly regional network. Further discussions with state, regional and local stakeholders are necessary to define a workable regional governance structure.

Planning for a Regional HOT Network is in the initial stages. General financial feasibility, travel and air quality benefits, and policy and governance issues have been identified, but more detailed analysis is needed to address specific technical and policy matters.

This EIR analyzes a proposed HOT network as a part of the proposed Project at a programmatic level. As the HOT network is just one component of the overall Plan, this programmatic EIR does not provide a more detailed analysis of the Regional HOT Network. That analysis will occur when planning for the proposed HOT network is detailed enough to allow meaningful environmental review and public comment. More refined analysis would include, but not be limited to: corridor construction phasing; setting appropriate toll rates; identifying lane ingress/egress locations; Caltrans facility design review; and more refined cost and revenue estimates. This more refined analysis will then allow a review of equity considerations, mapping out a governance structure, facilitating a public dialogue and developing a financing plan.

In looking at how the total \$226 billion projected revenue is spent, most of the projected revenue is allocated to maintaining and operating the existing transportation system (\$166 billion, or 73 percent of the total anticipated revenue available). The other key set of investments target strategic expansion to support anticipated population and employment growth and the accompanying travel demand in the Bay Area over the next 25-years (\$60 billion). Looking at Plan expenditures by mode, most of the projected revenue goes toward transit (\$149 billion or 66 percent) as compared to roadways (\$77 billion or 34 percent). Figure 1.2-5 displays the 25-year plan expenditures by type for the financially constrained Transportation 2035 Plan.

Figure 1.2-5: Total 25-Year Revenue Expenditures (Financially Constrained Element)



Unconstrained Element

Although SAFETEA-LU maintains financial constraint, it allows the financial element to include, for illustrative purposes, additional projects that would be included in the adopted plan if reasonable additional resources beyond those identified in the financially constrained element were available. Illustrative projects do not have the same status as financially constrained projects. They are not included in the air quality conformity analysis of the Plan, nor can they be programmed directly into the Transportation Improvement Program (TIP). However, if additional funding sources were secured, the financially unconstrained element of the proposed Transportation 2035 Plan would be integral in delivering not just new projects but improved system performance for Bay Area travelers by targeting new funds to prioritized projects.

The illustrative projects identified for the financially unconstrained element of the proposed Transportation 2035 Plan include: Dumbarton Rail, Caltrain Express Phase 2b, and Transbay Transit Center Phase 2. These projects are not fully funded and therefore not included in the financially constrained Transportation 2035 Plan. However, should funding become available and these projects become fully funded, then they may be shifted into the financially constrained element of the plan.

TRANSPORTATION 2035 INVESTMENTS BY CORRIDOR

This EIR focuses on regional impacts and, when necessary to the analysis, transportation corridor impacts. Fourteen multi-modal travel corridors have been identified in past plans, and are used here in this EIR for organizational purposes only. Figure 1.2-6 shows the location of the 14 corridors in the region. A subset of financially constrained element (shown as committed and new commitment projects) and financially unconstrained element projects for each corridor are listed and illustrated in Figures 1.2-7 through 1.2-21. A comprehensive list of transportation projects and programs in the proposed Transportation 2035 Plan is included in *Appendix C*.

About half of the projects included in the Transportation 2035 Plan have potential for physical environmental impacts, based on basic characteristics such as expansion, construction, or widening of infrastructure (e.g. new roads, new lanes, new alignments, new rail transit right-of-way). Of those, about 120 are committed projects, two thirds of which were previously evaluated in the EIR on the Transportation 2030 Plan. About 150 are new project commitments or illustrative projects with the potential to cause physical environmental change.

Table 1.2-6: Golden Gate Corridor

Note: Committed and programmatic projects are NOT mapped.

** Heavy Maintenance/Climate Protection Emphasis Alternatives*

Project ID	Map ID	Description
Financially Constrained Element: Committed Projects		
21012		*Golden Gate Bridge seismic retrofit (completes Phases 2 and 3)
21320		*Construct Golden Gate Bridge moveable median barrier
21884		*Construct Petaluma crosstown connector/interchange
21902		*Widen U.S. 101 for HOV lanes from Pepper Road to Rohnert Park Expressway (Central Phase A)
21908		*Study the environmental impacts of a future Port Sonoma ferry service and facility
22001		*Implement Sonoma Marin Area Rail Transit District (SMART) commuter rail project (includes environmental, engineering, right-of-way, vehicle procurement, and operations)
22652		*Rehabilitate pavement on U.S. 101 from Steele Lane to Grant overhead in Healdsburg
22655		*Widen U.S. 101 for HOV lanes (one in each direction) from Rohnert Park Expressway to Santa Rosa Avenue
22656		*Improve U.S. 101/East Washington Street interchange
94563		*Widen U.S. 101 for HOV lanes (one in each direction) from Lucky Drive in Corte Madera to North San Pedro Road in San Rafael
98102		*Reconstruct the South Access to the Golden Gate Bridge: Doyle Drive (environmental study)
98183		*Widen U.S. 101 for HOV lanes between Steele Lane and Windsor River Road (Phase A)
Financially Constrained Element: New Commitment Projects		
21030	19	Improve U.S. 101/I-580 interchange (project approval and environmental design phases only)
21315	17	Signalize ramp intersections at U.S. 101/Miller Creek Road interchange
21325	20	Improve local access to U.S. 101 from Tamalpais Drive to just north of Sir Francis Drake Boulevard
22191	6	Improve U.S. North/Airport Boulevard interchange
22193	2	Construct new bypass on Route 116 in Forestville
22194	7	*Improve safety on Mark West Springs/Porter Creek Road
22195	13	Improve U.S. 101/Old Redwood Highway interchange
22197	12	Improve local circulation at various locations in Town of Penngrove
22203	9	Improve channelization and traffic signalization on River Road from Fulton Road to the town of Guerneville
22204	8	Widen Fulton Road from 2 to 4 lanes from Guerneville Road to U.S. 101 and construct Route 12/Fulton Road interchange
22205	10	Improve U.S. 101/Hearn Avenue interchange
22207	11	Extend Farmers Lane from Bellevue Avenue to Bennett Valley Road

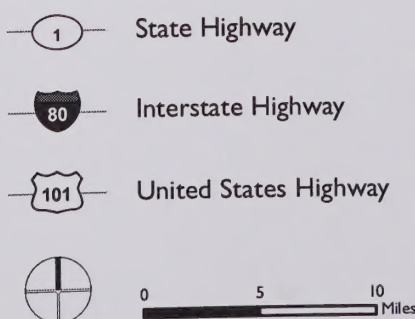
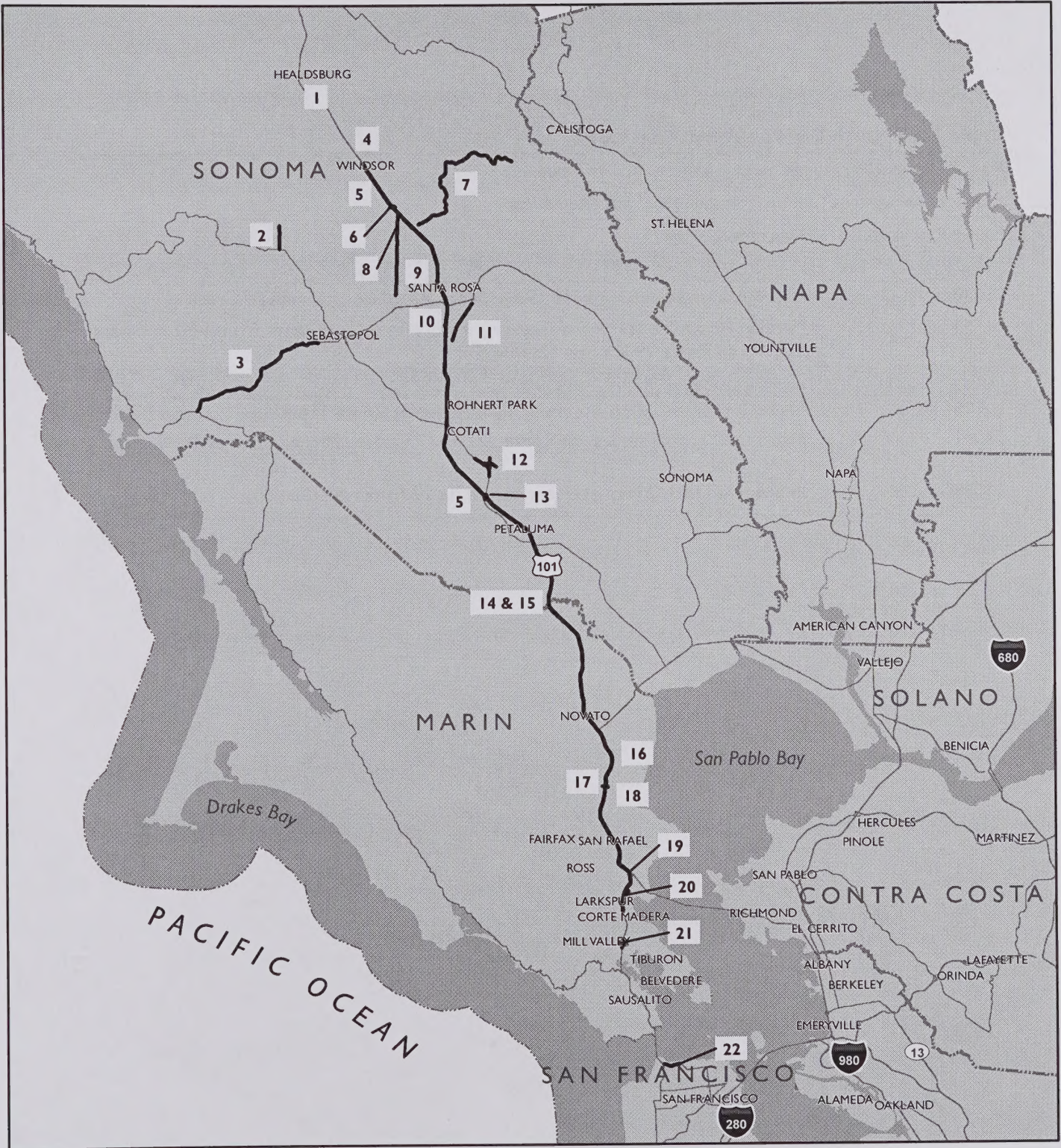
Table I.2-6: Golden Gate Corridor

Note: Committed and programmatic projects are NOT mapped.

** Heavy Maintenance/Climate Protection Emphasis Alternatives*

Project ID	Map ID	Description
22437	16	Construct auxiliary lanes at various locations along U.S. 10
22438	3	Improve Bodega Highway west of Sebastopol
22753		Construct park-and-ride lots to support regional express bus service
94089	22	*Reconstruct south access to the Golden Gate Bridge, from Doyle Drive to Broderick Street (design and construction phases)
94689	4	Improve U.S. 101/Arata Lane interchange in Windsor (Phase 4)
98179	21	Improve U.S. 101/Tiburon Boulevard interchange
230345	1	Rehabilitate or replace existing Healdsburg Avenue Bridge
230431		Construct intermodal transit hub in Southern Marin Priority Development Area and/or in the city of Novato
230688	18	Regional HOT Network: U.S. 101 from Corte Madera to Route 37 – convert HOV lanes to HOT lanes
230689	5	Regional HOT Network: U.S. 101 from Windsor River Road to Old Redwood Highway – widen to add HOV lane and convert HOV lanes to HOT lanes
230701	14	Widen U.S. 101 (adding an HOV lane in each direction) from Route 37 to Marin/Sonoma County line (Marin County portion) and from Marin/Sonoma County line to Old Redwood Highway in Petaluma
230702	15	Regional HOT Network: U.S. 101 from Route 37 to Old Redwood Highway – convert to HOT lanes

Figure I.2-7
Golden Gate Corridor



New Commitment Projects, Metropolitan Transportation Commission, 2008;
Street base data and county base data, Tele Atlas North America, Inc., 2008.

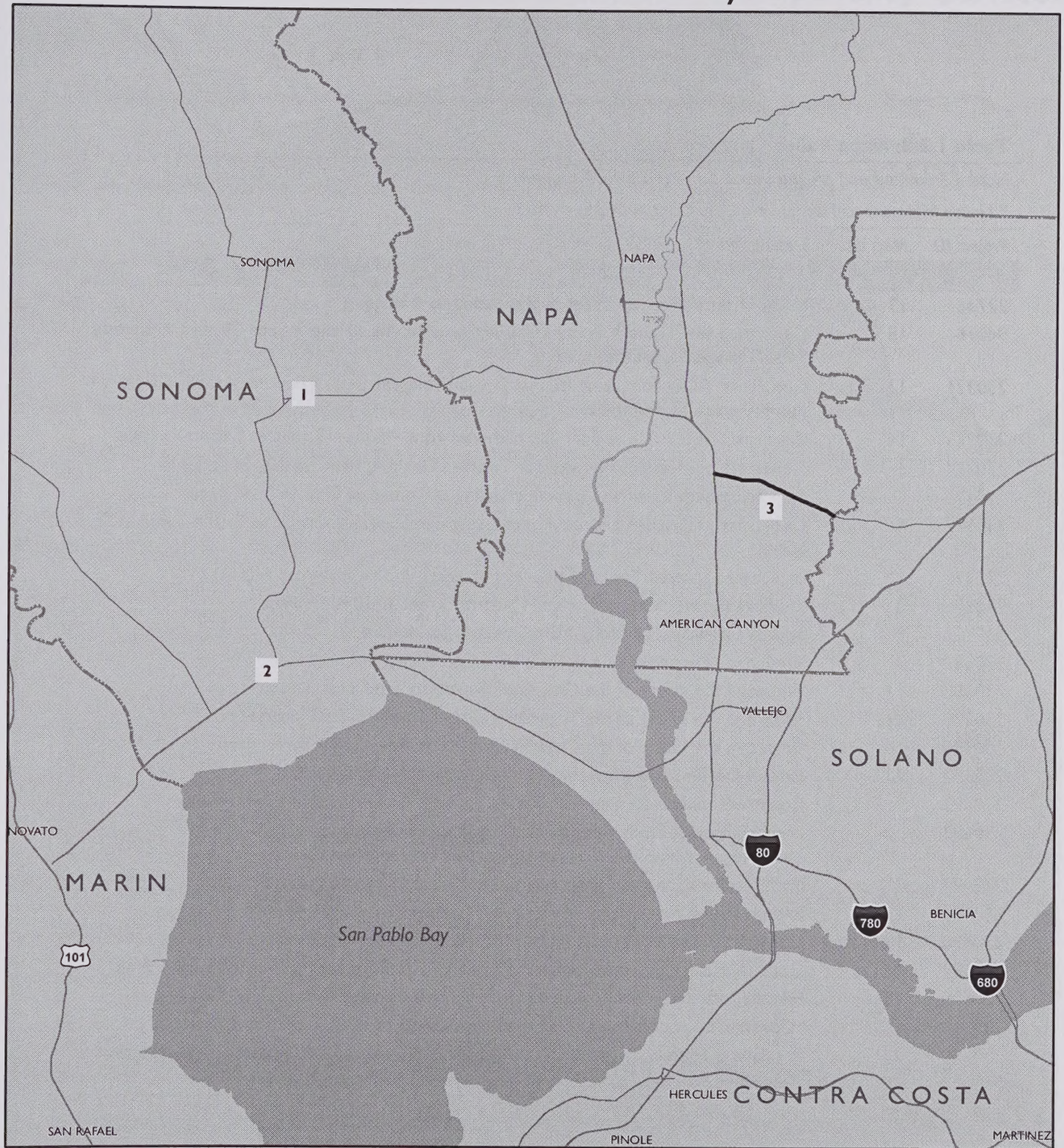
Table 1.2-7 North Bay East-West Corridor

Note: Committed and programmatic projects are NOT mapped.

** Heavy Maintenance/Climate Protection Emphasis Alternatives*

<i>Project ID</i>	<i>Map ID</i>	<i>Description</i>
Financially Constrained Element: Committed Projects		
21070		*Realign and widen Route 116 (Stage Gulch Road) along Champlin Creek
94152		*Widen Route 12 (Jamieson Canyon) from 2 lanes to 4 lanes from I-80 in Solano County to Route 29 in Napa County (Phase 1)
Financially Constrained Element: New Commitment Projects		
22190	2	Improve channelization and traffic signalization at Route 116/Route 121 intersection
94691	1	Install traffic signal system on Route 121 and improve channelization at 8th Street
230599	3	Implement Phase 2 improvements to Route 12 (Jamieson Canyon)

Figure I.2-8
North Bay East-West Corridor



-  State Highway
-  Interstate Highway
-  United States Highway



0 2.5 5 Miles

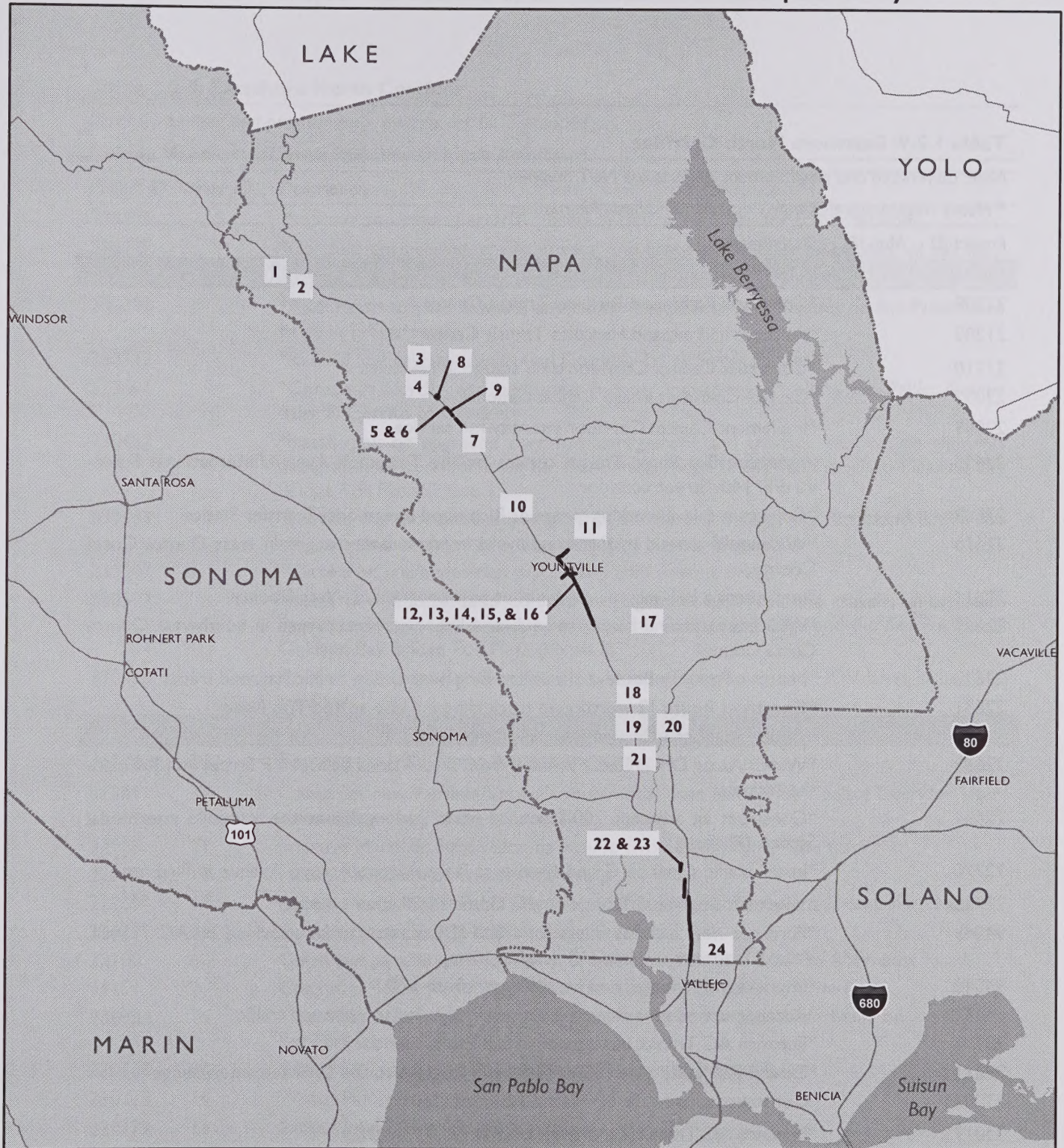
Table 1.2-8: Napa Valley Corridor

Note: Committed and programmatic projects are NOT mapped

** Heavy Maintenance/Climate Protection Emphasis Alternatives*

Project ID	Map ID	Description
Financially Constrained Element: New Commitment Projects		
22746	19	Widen Route 29/First Street overcrossing to 4 lanes
94076	18	Construct the Trancas intermodal facility adjacent to the Route 29 and Redwood Road/Trancas Street interchange
230371	13	Construct ADA-compliant pedestrian and bicycle path from Presidents Circle to railroad track in Yountville
230373	14	Construct pedestrian and bicycle pathway from Madison Street to Solano Avenue
230374	6	Construct pedestrian crosswalk at Charter Oak and Main Streets in St. Helena
230376	4	Construct pedestrian and bicycle crossing at Tunnel of Elms in St. Helena
230377	5	Construct pedestrian and bicycle crossing over Sulphur Creek at Oak Avenue in St. Helena
230378		Implement accessibility improvement projects in downtown St. Helena
230379	8	Improve the truck route between Adams Street and Main Street
230381	9	Improve signalization along Main Street in St. Helena
230387	3	*Improve safety at the Deer Park/Silverado Trail intersection
230388	17	*Improve the safety of the Oak Knoll/Silverado Trail intersection
230389	11	*Improve the safety of the Yountville Cross/Silverado Trail intersection
230390	10	*Improve the safety of the Oakville Crossroad/Route 29 intersection
230392	23	Extend Devlin Road from Fagan Creek to Green Island Road
230393	7	Construct middle-turn lane on Route 29 from Galleron Lane to St. Helena
230483	20	Prepare Project Study Report (PSR) to improve Silverado Trail/Third/Coombsville/East and Silverado Trail intersection
230484	21	Install traffic signals on Imola Avenue at Route 29 ramps in Napa
230486	22	Extend Devlin Road from Tower Road to Airpark Road in American Canyon
230498	12	Construct Class I bicycle trail from Route 29 to Silverado Trail
230499	16	Construct bicycle/pedestrian path from Oak Circle to south Yountville town limit
230508	15	Elevate Solano Avenue from Yountville to Dry Creek Road
230518	1	*Construct a roundabout at Forest Road/Route 128
230519	2	Improve the safety of the Route 29/Route 128 (Rutherford Crossroad) intersection
230622	24	Construct new bicycle/pedestrian trail through American Canyon

Figure I.2-9
Napa Valley Corridor



- 1 State Highway
- 80 Interstate Highway
- 101 United States Highway



0 5 10 Miles

Table 1.2-9: Eastshore North Corridor

Note: Committed and programmatic projects are NOT mapped

** Heavy Maintenance/Climate Protection Emphasis Alternatives*

Project ID	Map ID	Description
Financially Constrained Element: Committed Projects		
21208		*Construct Richmond Parkway Transit Center
21209		*Relocate and expand Hercules Transit Center
21210		*Construct Capitol Corridor train station in Hercules
22003		*Capitol Corridor: Phase 2 enhancements
22009		*Implement Capitol Corridor intercity rail service
22455		Implement Bus Rapid Transit service on the Telegraph Avenue/International Boulevard/E. 14th Street corridor
22603		*Construct 6-level parking garage at Richmond Intermodal Transfer Station
22610		*Widen and extend major streets, and improve interchanges in west Contra Costa County
22611		*Implement a low-income student bus pass program in West County
22613		*Widen and extend major streets, and improve interchanges in southwest Contra Costa County
22630		*Improve Parkway Boulevard overcrossing over Union Pacific Railroad tracks
22631		*Construct Route 12 westbound truck climbing lane at Red Top Road
22632		*Widen American Canyon Road overpass at I-80
22633		*Widen Azuar Drive/Cedar Avenue from 2 to 4 lanes between P Street and Residential Parkway
22634		*Construct an adjacent 200-space, at-grade parking lot at the Vacaville Intermodal Station (Phase I)
22770		*Install traffic signal on Grand Avenue at Rose Avenue/Arroyo Avenue in Piedmont
22780		Implement Bus Rapid Transit on the Grand-MacArthur corridor
94045		*Purchase new express buses for I-80 HOV service to be provided by AC Transit, Vallejo Transit and WestCAT (capital costs)
94048		*Improve interchanges and parallel arterials to I-80
94541		*Reconstruct existing Benicia-Martinez Bridge for southbound traffic
98157		*Enhance AC Transit bus service in San Pablo corridor
98211		*Extend I-80 eastbound HOV lanes from Route 4 to the Crockett interchange
230094		*Construct soundwalls in Central Alameda County
230193		*Enhance AC Transit Zero Emission Bus (ZEB) program
230194		*Implement AC Transit Environmental Sustainability Program
230195		*Improve safety and security on AC Transit vehicles and in facilities
230196		*Implement AC Transit San Pablo Dam Road Transit Priority Measures (TPM)
230221		*Implement I-80 Integrated Corridor Mobility (ICM) project operations and management
230222		*Implement San Pablo Avenue SMART Corridors operations and management

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Table 1.2-9: Eastshore North Corridor

Note: Committed and programmatic projects are NOT mapped

** Heavy Maintenance/Climate Protection Emphasis Alternatives*

Project ID	Map ID	Description
230225		*Improve and expand arterial streets in central Hercules for transit facilities
230227		*Conduct engineering, environmental and financial feasibility assessment of rail mass transit to western Contra Costa County
230293		*Add transit stops, sidewalks, and bicycle and pedestrian amenities on San Pablo Dam Road in El Sobrante
230322		*Rebuild and relocate eastbound Cordelia Truck Scales Facility
230401		*Construct bicycle- and pedestrian-friendly improvements along San Pablo Avenue from El Cerrito to Crockett
230402		*Install new or upgraded corridor management and traveler information elements along the I-80 corridor from the Carquinez Bridge to the San Francisco-Oakland Bay Bridge Toll Plaza (Phase 1)
230505		*Provide transportation improvements on the east side of the Richmond BART station to accommodate redevelopment for a transit village
230542		*Close a bicycle/pedestrian gap at San Pablo Avenue bridge
230597		*Install new or upgraded corridor management and real-time traveler information improvements in I-80 corridor between the Carquinez Bridge and the San Francisco-Oakland Bay Bridge Toll Plaza (Phase 2)
230650		*Widen I-80 from Red Top Road to Airbase Parkway to add HOV lanes in both directions

Financially Constrained Element: New Commitment Projects

21144	19	Reconstruct I-80/Gilman Avenue interchange
21341	3	Construct new Fairfield/Vacaville multimodal train station for Capitol Corridor inter-city rail service (Phases 1, 2 and 3)
22089	21	Improve Martinez Subdivision to include two additional mainline tracks
22355	18	Modify I-80/Central Avenue interchange
22360	17	Reconstruct I-80/San Pablo Dam Road interchange and modify adjacent interchanges
22629	9	Construct new Vallejo Baylink Ferry Terminal
22700	6	Construct parallel corridor north of I-80 from Red Top Road to Abernathy Road
94151	2	Construct 4-lane Jepson Parkway from Route 12 to Leisure Town Road
230084	16	Construct a railroad grade separation at the Richmond Waterfront on the Marina Bay Parkway
230108	22	Widen I-80 eastbound Powell Street off-ramp in Emeryville
230229	14	Widen Pinole Valley Road ramps at I-80
230279	13	Extend John Muir Parkway in Hercules
230318	15	Extend North Richmond truck route along Soto Street from Market Avenue to Parr Boulevard
230321	12	Construct Phase 2 of Hercules Intermodal Station
230326	5	Improve I-80/I-680/Route 12 Interchange (Phase 1)
230468	7	Provide auxiliary lanes on I-80 in eastbound and westbound directions from I-680 to Airbase Parkway
230635	4	Construct new 400-space parking garage at the Vacaville Intermodal Station (Phase 2)

Table I.2-9: Eastshore North Corridor

Note: Committed and programmatic projects are NOT mapped

** Heavy Maintenance/Climate Protection Emphasis Alternatives*

Project ID	Map ID	Description
230656	20	Regional HOT Network: I-80 from Alameda-Contra Costa County line to Bay Bridge — convert existing HOV lanes to HOT lanes
230657	11	Regional HOT Network: I-80 from Carquinez Bridge to Alameda-Contra Costa County line — convert existing HOV lanes to HOT lanes
230658	10	Regional HOT Network: I-80 from SR 37 to Carquinez Bridge - Widen to add HOV/HOT lane
230659	1	Regional HOT Network: I-80 from Yolo County line to Route 37 — widen to add HOV/HOT lane from Yolo County line to Air Base Parkway and from Red Top Road to Route 37
230660	8	Regional HOT Network: I-80 Red Top Road to Airbase Parkway — convert existing HOV lane to HOT lane

Figure I.2-10
Eastshore-North Corridor

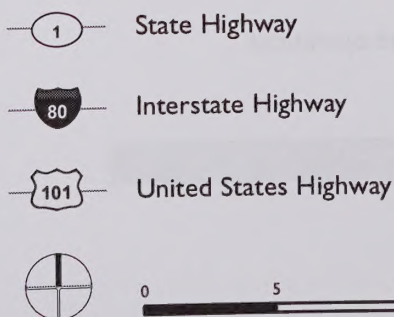
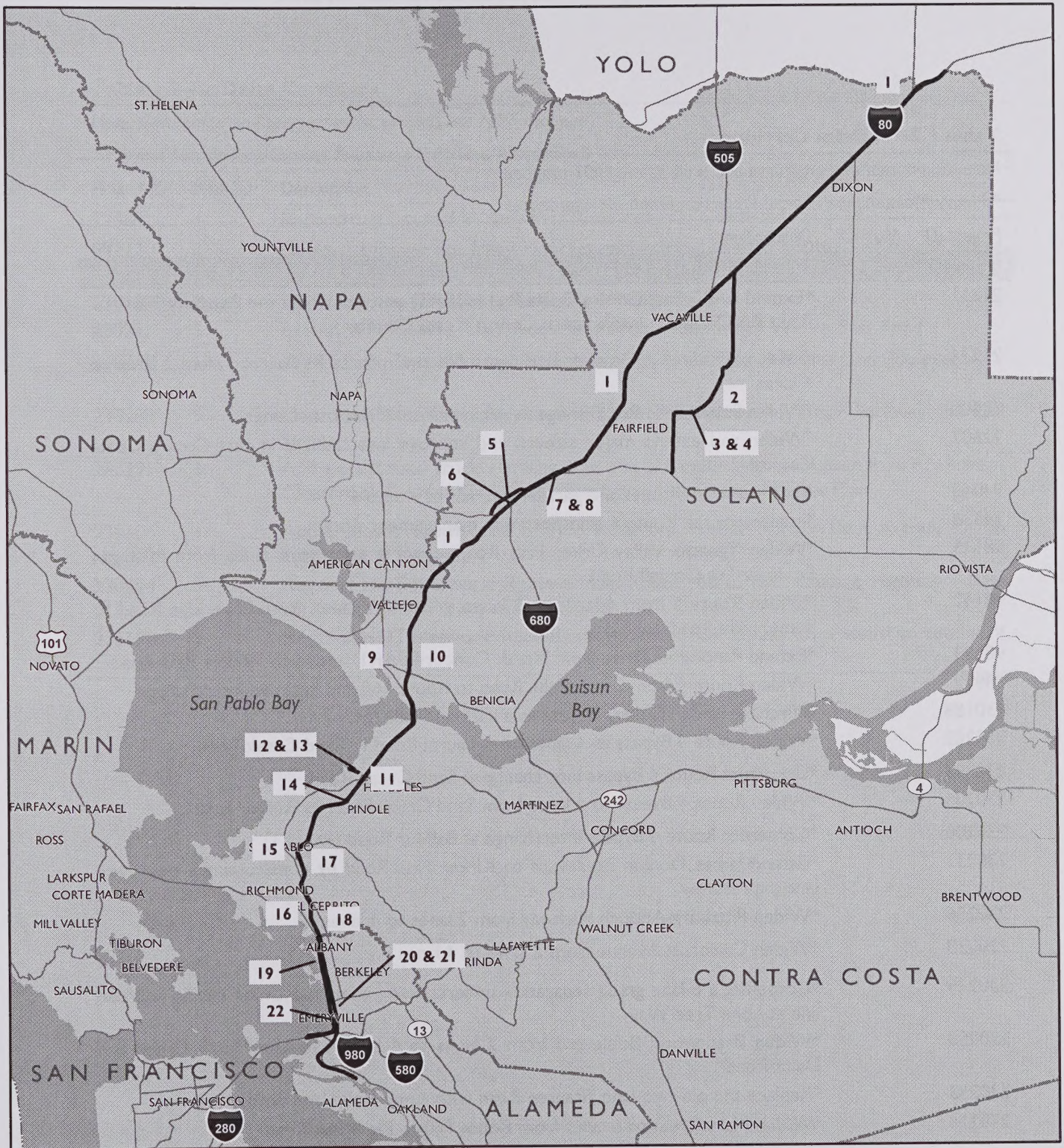


Table I.2-10: Delta Corridor

Note: Committed and programmatic projects are NOT mapped

** Heavy Maintenance/Climate Protection Emphasis Alternatives*

Project ID	Map ID	Description
Financially Constrained Element: Committed Projects		
21211		*Extend BART/East Contra Costa Rail (eBART) eastward from the Pittsburg/Bay Point BART station into eastern Contra Costa County
21214		*Widen Wilbur Avenue over Burlington Northern Santa Fe Railroad from 2 lanes to 4 lanes
22600		*Widen Somersville Road Bridge in Antioch from 2 lanes to 4 lanes
22607		*Widen and extend major streets, and improve interchanges in east Contra Costa County
94046		*Improve interchanges and parallel arterials to Route 4
94538		*Implement the Route 4 transportation management system
98115		*Widen Ygnacio Valley/Kirker Pass Roads from 4 lanes to 6 lanes from Michigan Boulevard to Cowell Road
98142		*Widen Route 4 from 4 lanes to 8 lanes, with HOV lanes, from Loveridge Road to Somersville Road
98193		*Extend Panoramic Drive from North Concord BART station to Willow Pass Road
98999		*Widen Route 4 from Somersville Road to Route 160 and improve interchanges
230188		*Purchase land in Oakley for use as a park-and-ride lot
230202		*Widen Route 4 Bypass to 4 lanes from Laurel Road to Sand Creek Road
230203		*Construct Route 4 Bypass interchange at Sand Creek Road
230205		*Widen Route 4 Bypass to 4 lanes from Sand Creek Road to Balfour Road
230206		*Construct Route 4 Bypass interchange at Balfour Road (Phase I)
230233		*Extend James Donlon Boulevard to Kirker Pass Road by constructing a new two-lane expressway
230236		*Widen Pittsburg-Antioch Highway from 2 lanes to 4 lanes
230238		*Widen California Avenue from 2 lanes to 4 lanes
230249		*Construct a 6-lane grade separation undercrossing along the Union Pacific Railroad line at Lone Tree Way
230250		*Widen Brentwood Boulevard from 2 lanes to 4 lanes between Marsh Creek and Delta Road
230253		*Replace the old two-lane Fitzuren Road with a new, four-lane divided arterial
230274		*Widen Main Street to 6 lanes from Route 160 to Big Break Road
230288		*Widen Empire Avenue from 2 to 4 lanes between Lone Tree Way and Union Pacific Railroad right of way/Antioch city limits
230535		*Realign curves along Marsh Creek Road to improve safety and operations
230538		*Widen Bailey Road lanes and shoulders
Financially Constrained Element: New Commitment Projects		

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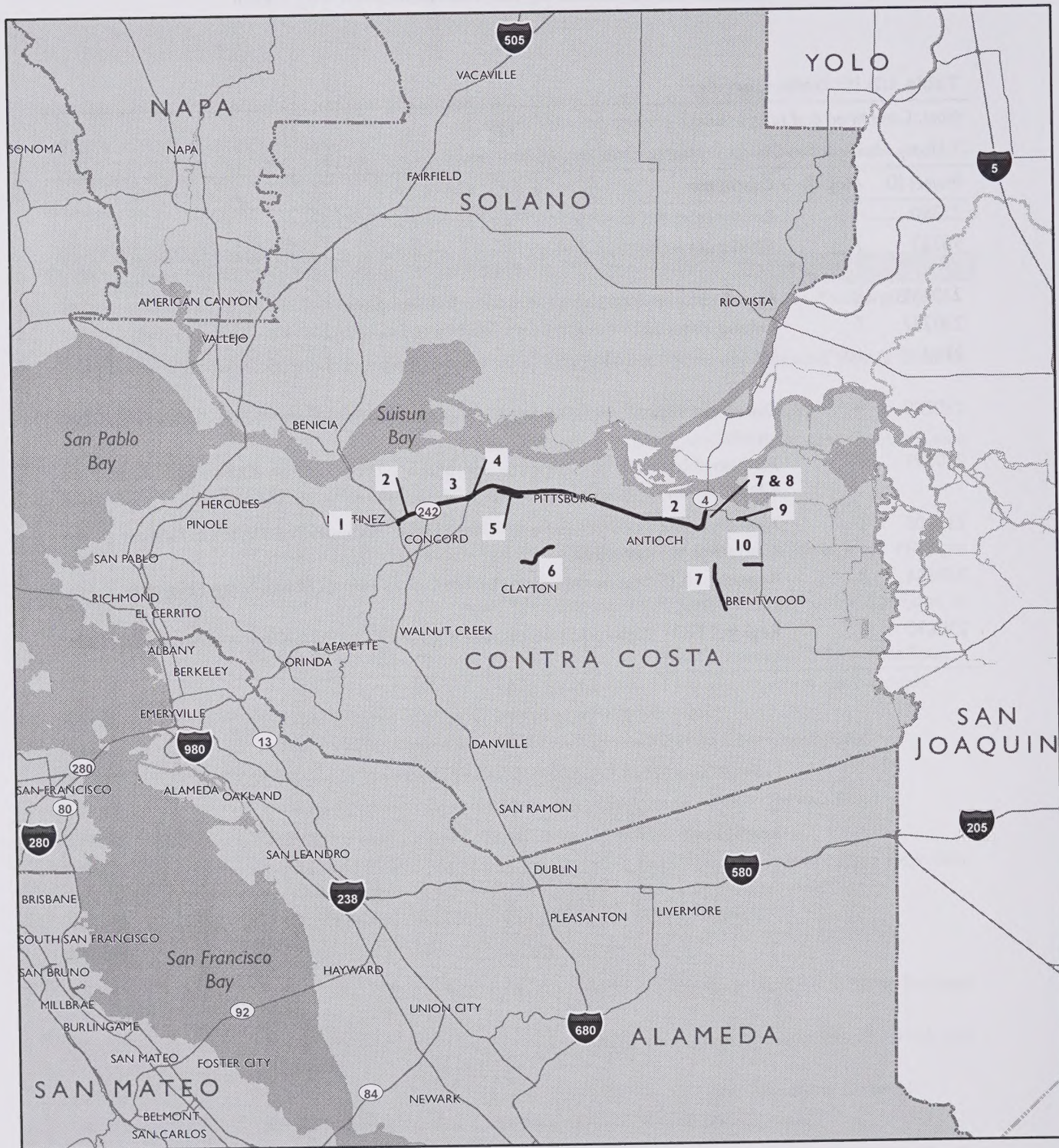
Table 1.2-10: Delta Corridor

Note: Committed and programmatic projects are NOT mapped

** Heavy Maintenance/Climate Protection Emphasis Alternatives*

Project ID	Map ID	Description
22390	4	Reconstruct Route 4/Willow Pass Road ramps in Concord
98222	7	Construct freeway-to-freeway direct connectors between Route 4 Bypass and Route 160
230232	8	Construct new interchange at Route 4/Phillips Lane
230237	5	Extend West Leland Road from San Marco Boulevard to Willow Pass Road
230247	10	Widen Lone Tree Way to 6 lanes from O'Hara Avenue to Brentwood Boulevard
230289	9	Construct Main Street Downtown Bypass road between Vintage Parkway and 2nd Street
230291	6	Add northbound truck climbing lane and a bicycle lane on Kirker Pass Road from Clearbrook Drive in Concord to just beyond the crest of Kirker Pass
230306	1	Add a second southbound lane on Alhambra Avenue from Walnut Avenue to the south side of Highway 4
230654	3	Regional HOT Network: Route 4 from Route 160 to Port Chicago Highway – convert existing HOV lanes to HOT lanes
230690	2	Regional HOT Network: I-680/Route 4 direct HOV connector – widen to add HOV lane

Figure 1.2-11
Delta Corridor



-  State Highway
-  Interstate Highway
-  United States Highway



0 5 10 Miles

Table 1.2-11: Diablo Corridor

Note: Committed and programmatic projects are NOT mapped

** Heavy Maintenance/Climate Protection Emphasis Alternatives*

Project ID	Map ID	Description
Financially Constrained Element: Committed Projects		
21206		*Construct a fourth bore at the Caldecott Tunnel complex north of the three existing bores
21207		*Construct Martinez Intermodal Station (Phase 3 initial segment)
22353		*Construct HOV lane on I-680 southbound between North Main Street and Livorna Road
22365		*Improve Martinez Ferry landside facilities
22402		*Implement the San Ramon School Bus Program, and continue the Lamorinda School Bus Program
22609		*Widen and extend major streets, and improve interchanges in central Contra Costa County
22637		*Construct BART crossover at Pleasant Hill BART station
94532		*Implement the Gateway Lamorinda Traffic Program
98126		*Improve interchanges and arterials parallel to I-680 and Route 24
98132		*Widen and extend Bollinger Canyon Road to 6 lanes from Alcosta Boulevard to Dougherty Road
98134		*Widen Dougherty Road to 6 lanes from Red Willow to Contra Costa County line
98194		*Extend Commerce Avenue from current terminus to Waterworld Parkway
98196		*Construct auxiliary lanes on Route 24 from Gateway Boulevard to Brookwood Road/Moraga Way
230212		*Improve Clayton Road/Treat Boulevard intersection and increase capacity
230239		*Widen and improve Buskirk Avenue between Monument Boulevard and Hookston Road
230320		*Extend the I-680 southbound HOV lane northward from Livorna Road to north of Rudgear Road
230596		*Construct Pacheco Boulevard Transit Hub on Blum Road at the I-680/Route 4 Interchange
230631		*Double the existing rail track between Oakley and Port Chicago
Financially Constrained Element: New Commitment Projects		
21205	6	Improve the I-680/Route 4 interchange and widen Route 4 between Route 242 and Morello
22352	13	Improve I-680/Norris Canyon Road
22354	3	Relocate the western half of the Marina Vista interchange off southbound I-680
22388	9	Construct Route 242 on-ramp and off-ramp at Clayton Road
22602	12	Construct I-680 auxiliary lanes in both directions from Sycamore Valley Road to Crow Canyon Road
22614	4	Construct Martinez Intermodal Station (Phase 3)
98133	7	Widen Pacheco Boulevard to 4 lanes from Blum Road to Arthur Road

Table I.2-11: Diablo Corridor

Note: Committed and programmatic projects are NOT mapped

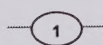
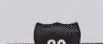
** Heavy Maintenance/Climate Protection Emphasis Alternatives*

<i>Project ID</i>	<i>Map ID</i>	<i>Description</i>
230216	10	Construct two-lane bridge connecting Waterworld Parkway with Meridian Park Boulevard
230240	8	Add additional left- or right-turn lanes at various intersections along Contra Costa Boulevard (between Monument Boulevard and 2nd Avenue)
230307	14	Widen Camino Tassajara Road from 2 lanes to 4 lanes from Windemere Parkway to the Alameda/Contra Costa County line
230308	11	*Straighten curves to improve safety and operation of Alhambra Valley Road
230309		Provide rolling stock, infrastructure and information technology for Bus Rapid Transit service in the Pacheco/Contra Costa Boulevard/North Main corridor
230685	5	Regional HOT Network: I-680 from Alcosta to Benicia-Martinez Bridge – widen to add HOV/HOT lane and convert existing HOV lanes to HOT lanes
230686	2	Regional HOT Network: I-680 from Benicia-Martinez Bridge to I-80 – widen to add HOV/HOT lane
230687	1	Regional HOT Network: I-680/I-80 direct HOV connector – widen to add HOV lane

Figure I.2-12
Diablo Corridor



Projects in the Financially Constrained Element are shown in **bold**, and projects in the Financially Unconstrained Element are shown in *italics*.

-  State Highway
-  Interstate Highway
-  United States Highway



0 5 10 Miles

New Commitment Projects, Metropolitan Transportation Commission, 2008;
Street base data and county base data, Tele Atlas North America, Inc., 2008.

Table I.2-12: Tri-Valley Corridor

Note: Committed and programmatic projects are NOT mapped

* Heavy Maintenance/Climate Protection Emphasis Alternatives

Project ID	Map ID	Description
Financially Constrained Element: Committed Projects		
21105		*Construct interchange at the extension of Isabel Avenue (Route 84) to I-580
21116		*Widen I-580 from Tassajara Road to Greenville Road for HOV and auxiliary lanes
21133		*Construct new West Dublin/Pleasanton BART station along the I-580 median
21455		*Widen I-238 to 6 lanes between I-580 and I-880, including auxiliary lanes on I-880 between I-238 and A Street
21456		*Construct auxiliary lanes on I-580 between Santa Rita Road/Tassajara Road and Airway Boulevard
21460		*Construct bicycle/pedestrian roadway in existing Alameda County and Southern Pacific right-of-way between the Dublin/Pleasanton BART station and Dougherty Road; construct bus lane on Dougherty Road
21473		*Construct a 4-lane arterial connecting Dublin Boulevard and North Canyons Parkway in Livermore
21489		*Improve I-580/San Ramon Road/Foothill Road interchange
22013		*Construct I-580 eastbound truck climbing lane at the Altamont Summit
22777		*Reconstruct on/off-ramps on I-580 in Castro Valley
230156		*Extend West Jack London Boulevard from west of Isabel/Route 84 to El Charro Road
230157		*Construct a two-lane gap closure on Las Positas Road from Arroyo Vista to west of Vasco Road
230160		*Tri-Valley Transit Access: implement enhanced rapid bus service in Livermore and Dublin
230630		*Tri-Valley Transit Access: construct westbound off-ramp to connect I-580 to Dublin/Pleasanton BART station (or equivalent)
Financially Constrained Element: New Commitment Projects		
21100	10	Construct auxiliary lanes on I-580 between Vasco Road and First Street and modify I-580/Vasco Road interchange
21139	1	*Improve Vasco Road with safety features
21475	11	Improve I-580/First Street interchange in Livermore
21477	12	Reconstruct I-580/Greenville Road interchange in Livermore
22765	4	Improve the connection between I-580 and I-680
22776	14	Widen Route 84 near Stanley Boulevard
98198	2	*Improve safety and operations on Vasco Road in Contra Costa and Alameda counties
230086	6	Reconstruct I-580/Fallon Road interchange and I-580/Hacienda Drive interchange in Dublin
230132	8	Improve I-580/Isabel Avenue interchange
230608	9	Construct a westbound auxiliary lane on I-580 between First Avenue and Isabel Avenue in the Tri-Valley area

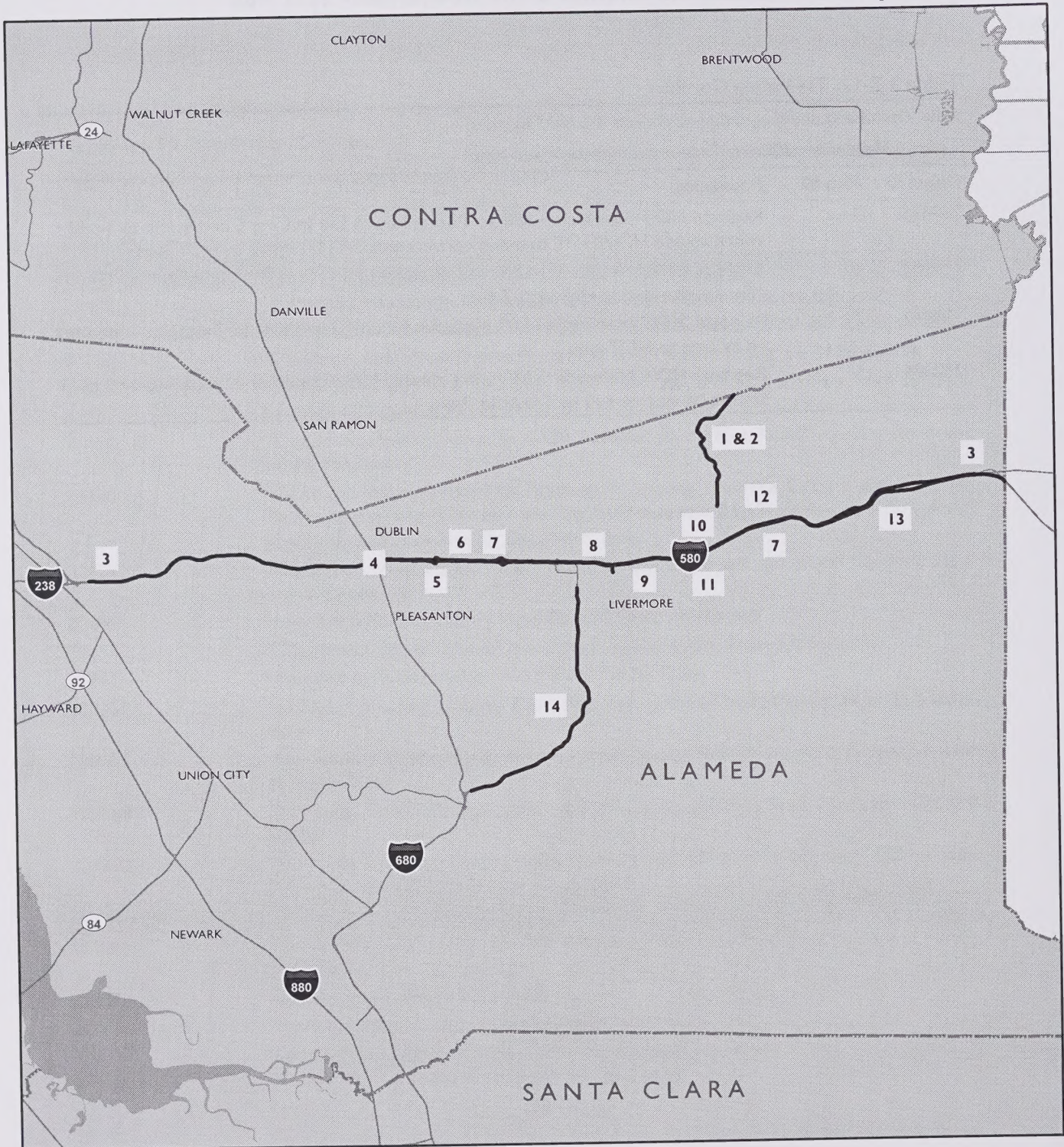
Table 1.2-12: Tri-Valley Corridor

Note: Committed and programmatic projects are NOT mapped

** Heavy Maintenance/Climate Protection Emphasis Alternatives*

<i>Project ID</i>	<i>Map ID</i>	<i>Description</i>
230665	3	Regional HOT Network: I-580 westbound from San Joaquin County line to I-680 – widen to add HOV/HOT lane and convert existing HOV lane to HOT lane
230666	13	Regional HOT Network: I-580 eastbound from San Joaquin County line to Greenville – widen to add HOV/HOT lane
230667	7	Regional HOT Network: I-580 eastbound from Greenville to Tassajara – convert HOV lane to HOT lane
230684	5	Regional HOT Network: I-680/I-580 direct HOV connector – widen to add HOV lane at connector and to Tassajara Road

Figure I.2-13
Tri-Valley Corridor



-  State Highway
-  Interstate Highway
-  United States Highway



0 5 10 Miles

New Commitment Projects, Metropolitan Transportation Commission, 2008;
Street base data and county base data, Tele Atlas North America, Inc., 2008.

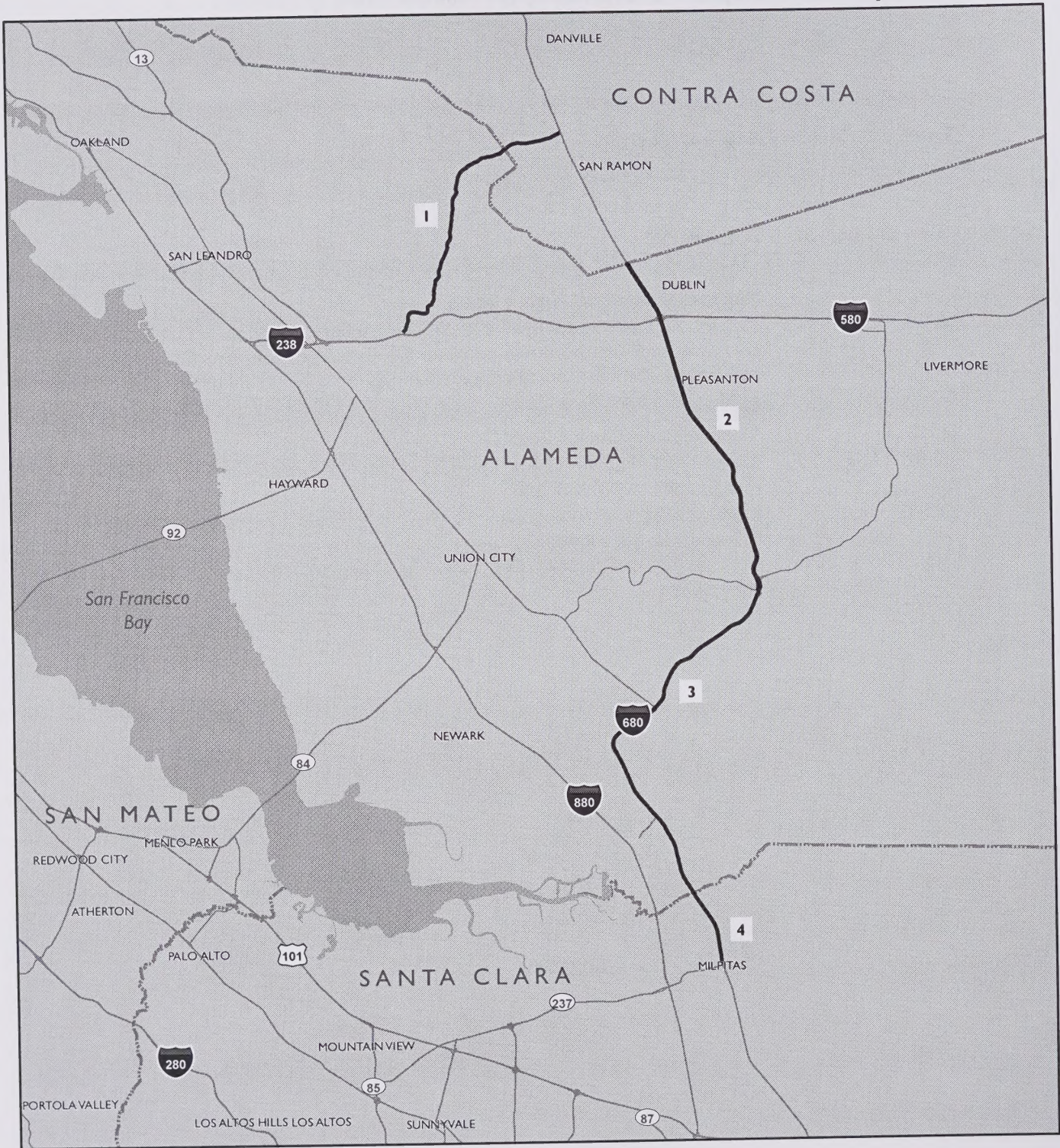
Table 1.2-13: Sunol Gateway Corridor

Note: Committed and programmatic projects are NOT mapped

** Heavy Maintenance/Climate Protection Emphasis Alternatives*

Project ID	Map ID	Description
Financially Constrained Element: Committed Projects		
21472		*Improve I-680/Bernal Avenue interchange
98139		Acquire right-of-way for the ACE Service between Stockton and Niles Junction, complete track improvements between San Joaquin County and Alameda County, and expand Alameda County station platforms
Financially Constrained Element: New Commitment Projects		
21112	1	*Improve Crow Canyon Road
230681	4	Regional HOT Network: I-680 northbound from Alameda County line to Calveras – widen to add HOV/HOT lane
230682	3	Regional HOT Network: I-680 northbound from Santa Clara County line to Route 84 – widen to add HOV/HOT lane
230683	2	Regional HOT Network: I-680 from Route 84 to Alcosta – widen to add HOV/HOT lane

Figure I.2-14
Sunol Gateway Corridor



-  State Highway
-  Interstate Highway
-  United States Highway



0 5 10 Miles

Table 1.2-14: Eastshore-South Corridor

Note: Committed and programmatic projects are NOT mapped

** Heavy Maintenance/Climate Protection Emphasis Alternatives*

Project ID	Map ID	Description
Financially Constrained Element: Committed Projects		
21093		*Upgrade Route 92/Clawiter Road interchange
21101		*Reconstruct Stargell Avenue from Webster Street to 5th Avenue
21131		*Build a BART Oakland Airport Connector between Coliseum BART Station and Oakland International Airport
21466		*Improve Washington Avenue/Beatrice Street interchange
22063		*Improve Route 238 corridor near Foothill Boulevard/I-580
22082		*Improve 7th Street/Union Pacific Railroad entry at Port of Oakland intermodal yards
22087		*Reconstruct I-880/Oak Street on-ramp
22100		*Replace overcrossing structure at I-880/Davis Street interchange
22106		*Construct street extensions in Hayward near Clawiter and Whitesell Streets
22670		*Construct HOV lane for southbound I-880 from Hegenberger Road to Marina Boulevard
22760		*Relocate the Outer Harbor Intermodal Terminal (OHIT) to the former Oakland Army Base
22769		*Implement BART Core Capacity Program - system capacity
230052		*Construct auxiliary lanes on I-880 near Winton in Haywar
230054		*Construct auxiliary lanes on I-880 at Industrial Parkway
230057		*Reconstruct I-880/Industrial Parkway interchange (Phase 2)
230066		*Improve I-880/Marina Boulevard interchange
230088		*Extend existing northbound I-880 HOV lane from north of Hacienda Avenue to Hegenberger Road
230091		*Install traffic monitoring systems, signal priority and coordination, and ramp metering in the I-880, I-238, and I-580 corridors
Financially Constrained Element: New Commitment Projects		
21103	14	Construct grade separation structure on Central Avenue at Union Pacific Railroad crossing
21451	10	Construct additional turn- and bus-loading lanes on Hesperian Boulevard and East 14th Street
22021		Expand AC Transit transfer centers and park-and-ride facilities in central Alameda County
22084	8	Improve access to Oakland International Airport's North Field
22766	6	Assess Fruitvale Avenue rail bridge for seismic retrofit
22768	5	*Retrofit and repair three Oakland-Alameda estuary bridges for seismic safety
22783	7	*Assess Fruitvale Avenue bridge for seismic retrofit
98207	3	Improve I-880/Broadway-Jackson interchange in Oakland
230047	12	Reconstruct I-880 West A Street interchange in Hayward
230053	13	Reconstruct I-880 Industrial Parkway interchange (Phase 1)

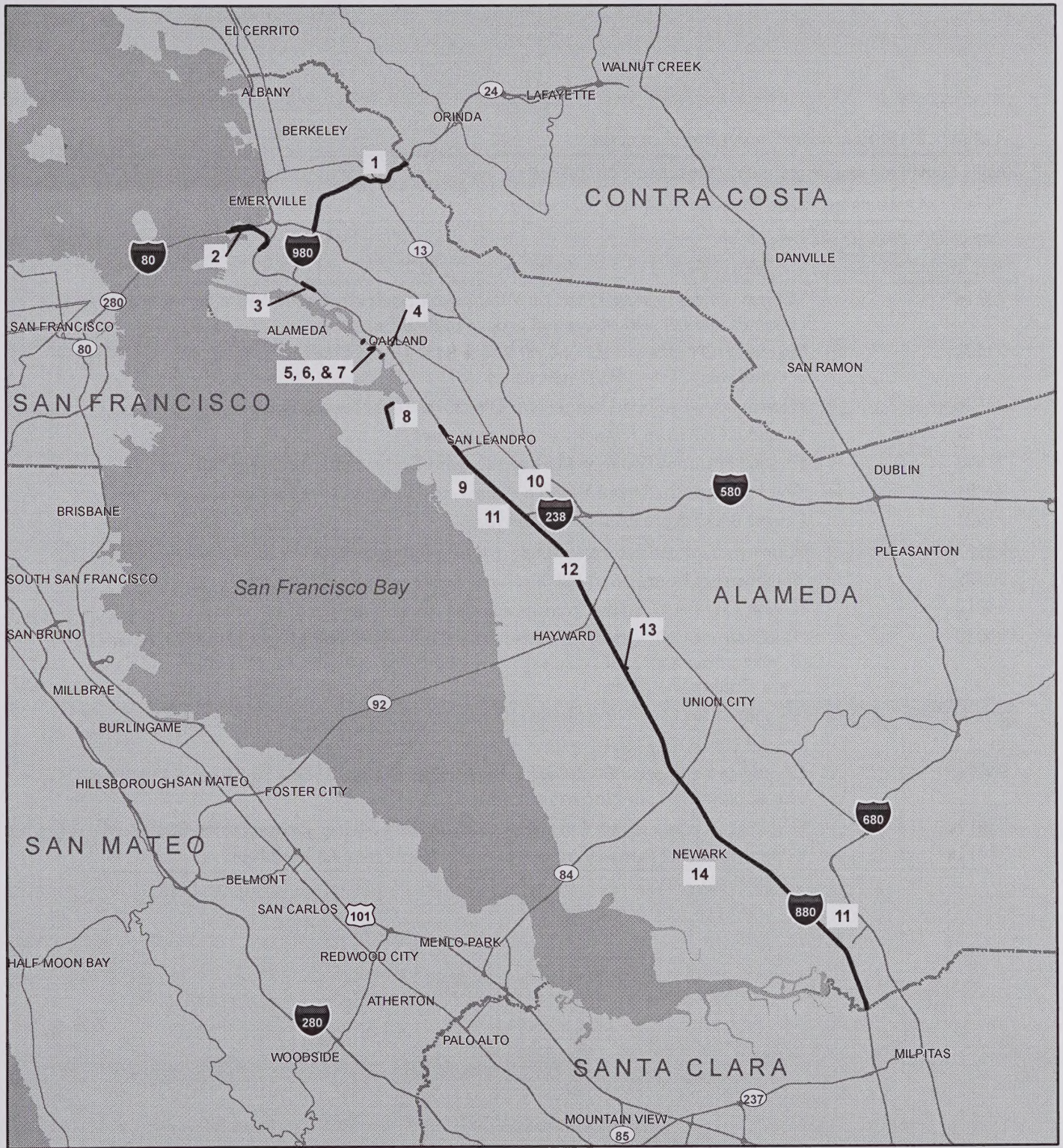
Table 1.2-14: Eastshore-South Corridor

Note: Committed and programmatic projects are NOT mapped

** Heavy Maintenance/Climate Protection Emphasis Alternatives*

Project ID	Map ID	Description
230120		Construct truck parking facilities in Northern Alameda County (Phase I)
230169		Provide Intelligent Transportation System elements for arterial management in Oakland
230170	4	Improve access to I-880 from 42nd and High Street
230171	1	Improve Route 24/Caldecott Tunnel
230198		Upgrade traffic signal systems with Intelligent Transportation System (ITS) elements
230669	11	Regional HOT Network: I-880 Alameda-Santa Clara County line to Marina Boulevard/Lewelling – convert HOV lanes to HOT lanes
230670	9	Regional HOT Network: I-880 from Marina/Lewelling to Hegenberger – convert HOV lanes to HOT lanes
230671	2	Regional HOT Network: I-880 16th Street to Bay Bridge Toll Plaza – convert HOV lanes to HOT lanes

Figure I.2-15
Eastshore-South Corridor



-  State Highway
-  Interstate Highway
-  United States Highway



0 5 10 Miles

New Commitment Projects, Metropolitan Transportation Commission, 2008;
Street base data and county base data, Tele Atlas North America, Inc., 2008.

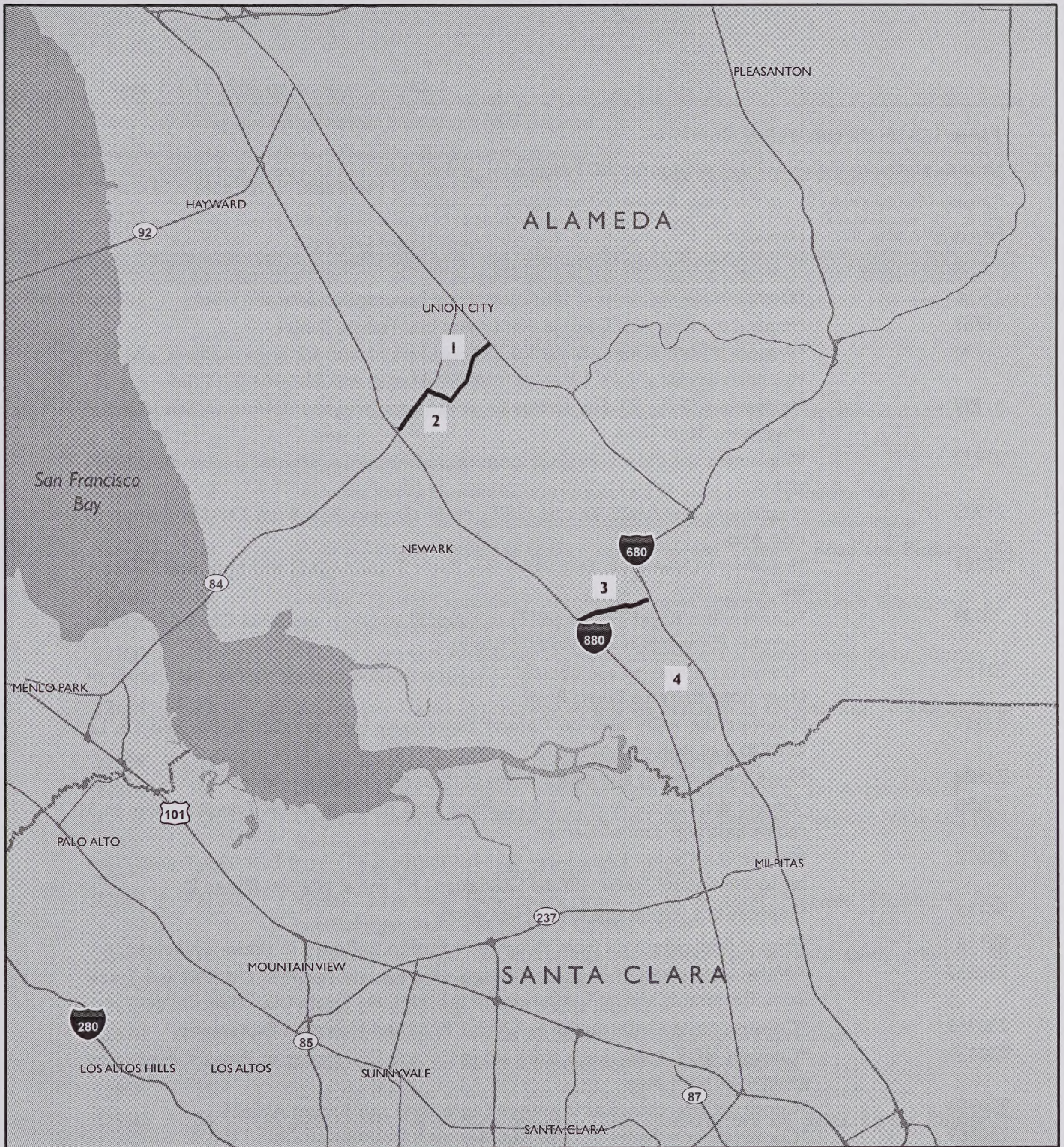
Table I.2-15: Fremont-South Bay Corridor

Note: Committed and programmatic projects are NOT mapped

** Heavy Maintenance/Climate Protection Emphasis Alternatives*

Project ID	Map ID	Description
Financially Constrained Element: Committed Projects		
21114		*Construct grade separations on Washington Boulevard/Paseo Padre Parkway at the Union Pacific railroad tracks and proposed BART extension
21125		*Extend HOV lane westbound on Route 84 between Newark Avenue undercrossing and just west of the I-880 interchange
21126		*Construct westbound Route 84 HOV on-ramp at Newark Boulevard
21132		Extend BART from Fremont to Warm Springs
21482		*Extend Fremont Boulevard to connect with Dixon Landing Road in Milpitas
21484		*Widen Kato Road from Warren Avenue to Milmont Drive to include bicycle lanes
21921		Extend BART from Fremont to San Jose
22062		*Construct infrastructure to support future Irvington BART station
22779		*Reconstruct Route 262/I-880 interchange and widen I-880 (Phase 2)
94012		*Union City BART station transit-oriented development project (Phase I)
94030		*Reconstruct I-880/Route 262 interchange and widen I-880 from 8 lanes to 10 lanes (8 mixed-flow and 2 HOV lanes) from Route 262 (Mission Boulevard) to the Santa Clara County line (Phase I)
Financially Constrained Element: New Commitment Projects		
21123	1	Expand Union City BART station to create intermodal rail station
94506	2	Construct an improved east-west connection between I-880 and Route 238 (Mission Boulevard) from North Fremont to Union City
230110	4	Construct a grade separation at Route 262/Warm Springs Drive/Mission Boulevard
230114	3	Widen Auto Mall Parkway from 4 to 6 lanes between I-680 and I-880

Figure I.2-16
Fremont-South Corridor



-  State Highway
-  Interstate Highway
-  United States Highway



0 2.5 5 Miles

Table I.2-16: Silicon Valley Corridor

Note: Committed and programmatic projects are NOT mapped

** Heavy Maintenance/Climate Protection Emphasis Alternatives*

Project ID	Map ID	Description
Financially Constrained Element: Committed Projects		
21760		*Double-track segments of the Caltrain line between San Jose and Gilroy
21787		*Expand the Palo Alto Caltrain Station and Bus Transit Center
21790		*Provide VTA's share of funds for additional train sets, passenger facilities, and service upgrades for the ACE service from San Joaquin and Alameda Counties
21797		*Implement Route 17 bus service improvements between downtown San Jose and downtown Santa Cruz
21922		*Implement the Mineta San Jose International Airport automated people-mover service
21923		*Implement Bus Rapid Transit (BRT) on El Camino Real from Diridon Station to Palo Alto
22014		*Implement Downtown East Valley Bus Rapid Transit (BRT) and Light Rail Phases 1 and 3
22019		*Convert Bus Rapid Transit (BRT) to light-rail transit in the Santa Clara-Alum Rock corridor (Downtown East Valley Phase 2)
22134		*Construct a lane on southbound U.S. 101 using the existing median from south of Story Road to Yerba Buena Road
22839		*Convert the HOV lane on Central Expressway between San Tomas and De La Cruz to a general purpose lane
22909		*Fund the operating and capital needs of Measure A transit services
22956		*Extend the Capitol Avenue light-rail line from the Alum Rock Transit Center to a rebuilt Eastridge Transit Center
22978		*Extend the Capitol Expressway light-rail transit (LRT) from Eastridge Transit Center to the Capitol Station on the Guadalupe LRT line in Nieman (Phase 2)
94117		*Improve bus stop accessibility systemwide
98119		*Extend light-rail transit from Winchester Station to Route 85 (Vasona Junction)
230267		*Widen and add HOV lanes on Montague Expressway between Lick Mill and Trade Zone Boulevards and on Guadalupe River Bridge and Penitencia Creek Bridge
230269		*Construct a new interchange at Trimble Road and Montague Expressway
230339		*Convert HOV queue-jump lanes along Central Expressway at Bowers Avenue to general purpose lanes
230356		*Construct interchange at Lawrence Expressway and Arques Avenue
230363		*Construct interchange at I-880 and Montague Expressway
Financially Constrained Element: New Commitment Projects		
21702	35	Construct interchange at U.S. 101 and Buena Vista Avenue
21714	38	Widen U.S. 101 between Monterey Highway and Route 25 and construct an interchange at U.S. 101/Route 25/Santa Teresa Boulevard
21719	24	Improve I-880/I-280/Stevens Creek Boulevard interchange
21720	31	Improve U.S. 101/Tennant Avenue interchange

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Table 1.2-16: Silicon Valley Corridor

Note: Committed and programmatic projects are NOT mapped

** Heavy Maintenance/Climate Protection Emphasis Alternatives*

<i>Project ID</i>	<i>Map ID</i>	<i>Description</i>
21722	7	Improve U.S. 101 southbound Trimble Road/De La Cruz Boulevard/Central Expressway interchange
21749	32	Extend Butterfield Boulevard from Tennant Avenue to Watsonville Road
21785	28	Reconfigure local roadway and interchange at U.S. 101/Blossom Hill Road in San Jose
22118	30	Extend Hill Road from East Main Avenue to Peet Avenue
22142	27	Improve U.S. 101/Capitol Expressway interchange
22145	2	Widen westbound Route 237 on-ramp from Route 237 to northbound U.S. 101 to 2 lanes
22153	11	Extend Mary Avenue north across Route 237
22156	12	Improve Route 85 northbound to Route 237 eastbound connector ramp
22162	13	Improve Route 237 westbound to Route 85 southbound connector ramp
22175	29	Widen Almaden Expressway to 8 lanes between Coleman Road and Blossom Hill Road
22179	18	Widen Central Expressway from 4 to 6 lanes between Lawrence Expressway and San Tomas Expressway
22180	19	Widen Central Expressway between Lawrence Expressway and Mary Avenue to provide auxiliary lanes
22186	22	Widen San Tomas Expressway to 8 lanes between El Camino Real (Route 82) and Williams Road
22809	34	Realign DeWitt Avenue/Sunnyside Avenue intersection
22814	15	Extend Foothill Expressway westbound deceleration lane at San Antonio Road
22815	17	Upgrade Miramonte Avenue bikeway to Class II between Mountain View and Foothill Expressway
22842	37	Improve Route 152/Ferguson Road intersection
22843	21	Widen Lawrence Expressway from 6 to 8 lanes between Moorpark Avenue/Bollinger Road and south of Calvert Court
22854	14	I-280/Oregon-Page Mill interchange modification (to enhance safety primarily for bicyclists and pedestrians traveling on Page Mill)
22873	16	Widen Loyola Bridge over Foothill Expressway
22878	10	Realign Wildwood Avenue to connect with Lawrence Expressway
22883	20	Modify medians on Lawrence Expressway for limited access
22895	25	Improve the operations of San Tomas Expressway/Route 17 interchange
22910	36	Add Traffic Operations System (TOS) infrastructure on Santa Teresa Boulevard between Day Road and Mesa Road
22925	33	*Realign existing curve on DeWitt Avenue between approximately Edmundson Avenue and Spring Avenue
22965	6	Construct U.S. 101/Mabury Road/Taylor Street interchange
230210	23	*Rebuild box culvert under San Tomas Expressway
230242	26	Add Capitol Expressway Traffic Operations System (TOS) between U.S. 101 and Almaden Expressway
230257	3	Convert HOV direct freeway connectors between I-880 and Route 237 to HOT

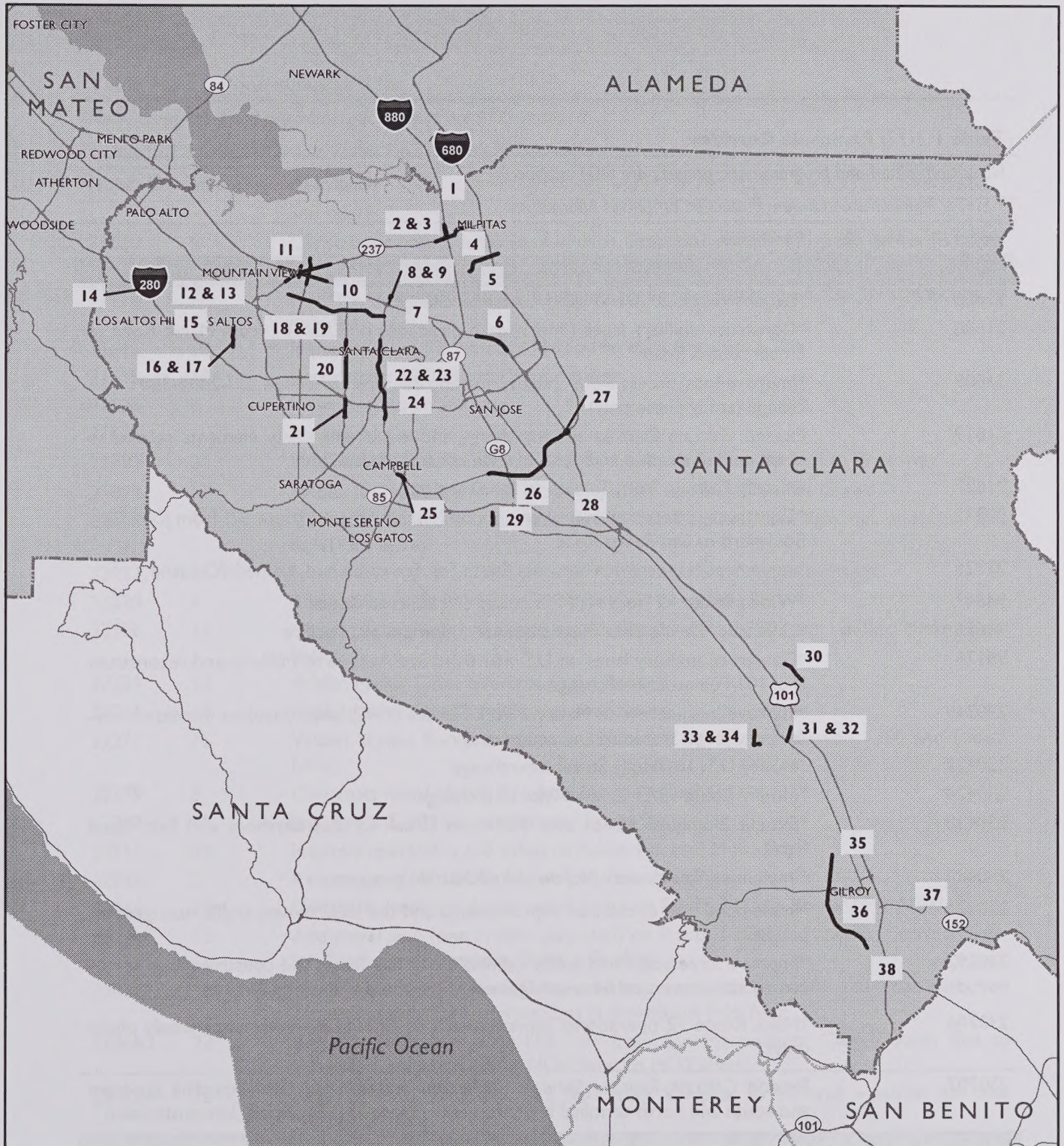
Table I.2-16: Silicon Valley Corridor

Note: Committed and programmatic projects are NOT mapped

** Heavy Maintenance/Climate Protection Emphasis Alternatives*

Project ID	Map ID	Description
		direct freeway connectors
230262	8	Construct a new interchange at U.S. 101 and Montague Expressway
230265	9	Improve the operations of the intersection of Montague Expressway and Mission College Boulevard
230273	5	Widen Montague Expressway to 8 lanes between Trade Zone Boulevard and I-680 and to 6 lanes between I-680 and Park Victoria Drive for HOV lanes
230298	4	Replace Calaveras Boulevard 4-lane bridge over the Union Pacific Railroad tracks
230302	1	Improve the intersection of Dixon Landing Road and North Milpitas Boulevard

Figure I.2-17
Silicon Valley Corridor



-  State Highway
-  Interstate Highway
-  United States Highway



0 5 10 Miles

Table I.2-17: Peninsula Corridor

Note: Committed and programmatic projects are NOT mapped

** Heavy Maintenance/Climate Protection Emphasis Alternatives*

Project ID	Map ID	Description
Financially Constrained Element: Committed Projects		
21606		*Reconstruct U.S. 101/Willow Road interchange
21608		*Construct auxiliary lanes (one in each direction) on U.S. 101 from Marsh Road to Embarcadero Road
21609		*Improve local access from Sneath Lane and San Bruno Avenue to I-280/I-380 interchange (study phase only)
21619		Expand Caltrain Express service: design and implement safety elements related to signal communication and positive train control (Phase 2a)
21627		Electrify Caltrain from Tamien to San Francisco
22232		*Construct streetscape improvements on Mission Street (Route 82) from John Daly Boulevard to San Pedro Road
22726		*Implement ferry service between South San Francisco and Alameda/Oakland
94643		*Widen Route 92 from Half Moon Bay city limits to Route 1
94656		*Construct Devil's Slide Bypass between Montara and Pacifica
98176		*Construct auxiliary lanes on U.S. 101 from 3rd Avenue to Millbrae and reconstruct U.S. 101/Peninsula interchange
230349		*Improve local access to National Park Service (NPS) lands (involves increased way-finding signage, materials and equipment)
230417		*Modify U.S. 101/Holly Street interchange
230424		*Modify Route 92/El Camino Real interchange
230428		*Extend Blomquist Street over Redwood Creek to East Bayshore and Bair Island Road
230430		*Implement San Mateo's bicycle and pedestrian program
230434		*Implement local circulation improvements and the local streets traffic management program
230592		*Improve streetscape and traffic calming along Bay Road, and construct new northern access connection between Demeter Street and University Avenue
230704		*Make Route 92 operational improvements to Chess Drive on-ramps (study phase only)
230707		Expand Caltrain Express Service: implement system-wide level boarding program and south and north terminal improvements (Phase 2b) (Financially Unconstrained)
Financially Constrained Element: New Commitment Projects		
21549	1	Implement direct access route from Hunters Point Shipyard to U.S. 101
21602	19	Reconstruct U.S. 101/Broadway interchange
21603	25	Modify U.S. 101/Woodside Road interchange
21604	5	Construct auxiliary lanes (one in each direction) on U.S. 101 from Sierra Point to San Francisco County line
21607	27	Modify University Avenue overcrossing of U.S. 101 to improve operational efficiency

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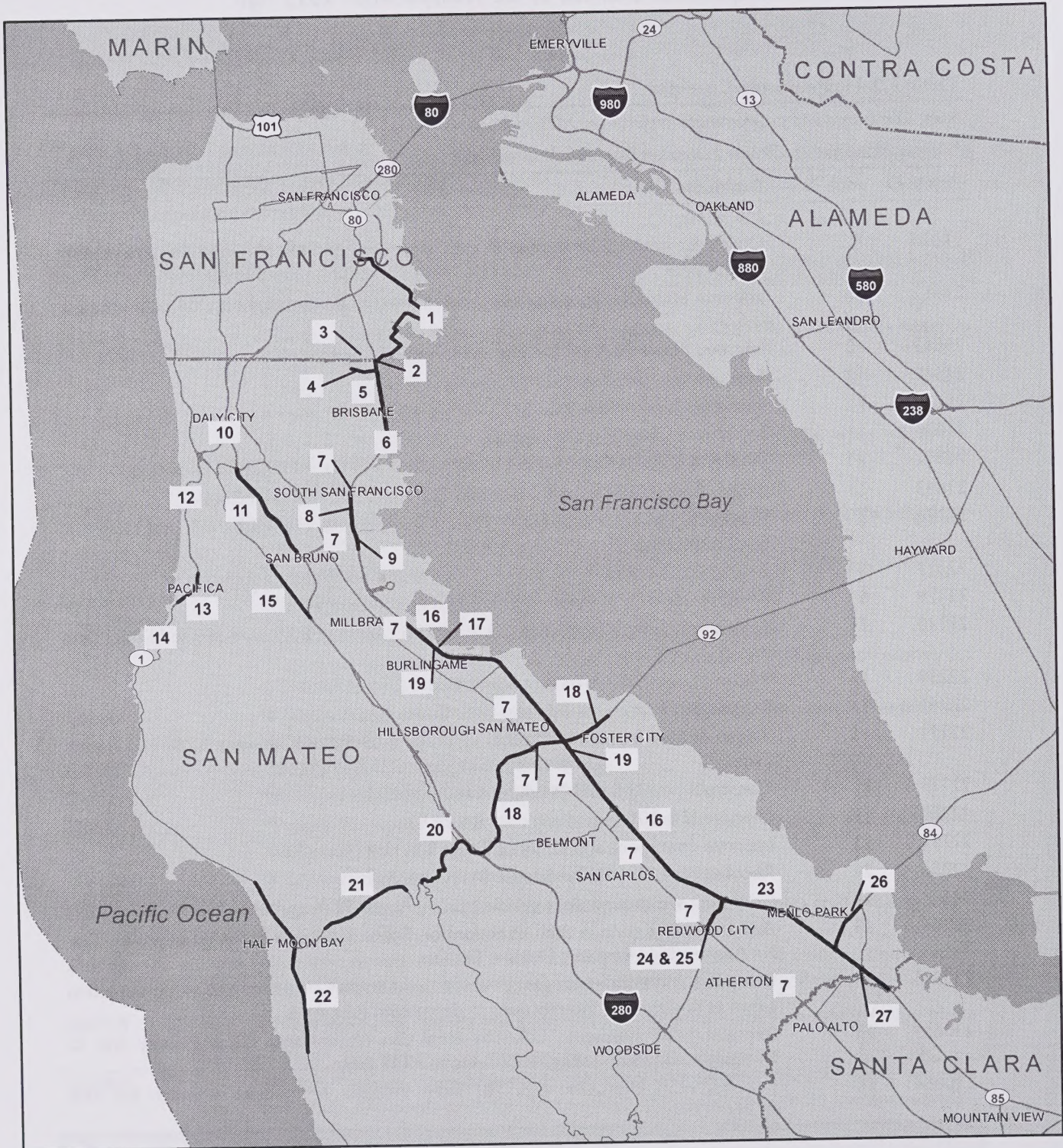
Table 1.2-17: Peninsula Corridor

Note: Committed and programmatic projects are NOT mapped

** Heavy Maintenance/Climate Protection Emphasis Alternatives*

Project ID	Map ID	Description
		and safety
21610	9	Construct auxiliary lanes (one in each direction) on U.S. 101 from San Bruno Avenue to Grand Avenue
21612	26	Improve access to/from west side of Dumbarton Bridge on Route 84 connecting to U.S. 101
21613	18	Improve Route 92 from San Mateo-Hayward Bridge to I-280
21615	10	Reconstruct I-280/Route 1 interchange
21623	7	Improve Caltrain stations
21626		Implement Caltrain grade separation program
21892	24	Widen Woodside Road from 4 to 6 lanes from El Camino Real to Broadway
21893	21	Widen Route 92 from Half Moon Bay city limits and Pilarcitos Creek
22226	3	Construct Bayshore Intermodal Facility for Caltrain, Muni light rail, and Muni and SamTrans buses
22227	4	Extend Geneva Avenue to the U.S. 101/Candlestick Point interchange
22229	6	Reconstruct U.S. 101/Sierra Point Parkway interchange
22230	11	Construct auxiliary lanes (one in each direction) on I-280 from I-380 to Hickey Boulevard
22239	12	Widen Manor Drive overcrossing at Route 1
22261	14	Replace San Pedro Creek Bridge over Route 1
22271	15	Widen Skyline Boulevard (Route 35) from 2 to 4 lanes between I-280 and Sneath Lane
22279	8	Construct new U.S. 101/Produce Avenue interchange
22282	19	Improve U.S. 101 operations near Route 92
22751	22	Improve operations and safety of Route 1 in Half Moon Bay
22756	2	Reconstruct U.S. 101/Candlestick Point interchange
94644	20	Construct westbound slow-vehicle lane on Route 92 from Route 35 to I-280
98204	13	Add travel lane (one in each direction) on Route 1 (Calera Parkway) between Fessler Avenue and Westport Drive in Pacifica
230385		*Purchase and install emergency vehicle pre-emption detectors and video detection cameras at signalized intersections in downtown Palo Alto
230663	23	Regional HOT Network: U.S. 101 from San Mateo/Santa Clara County line to Whipple – convert existing HOV lanes to HOT lanes
230664	16	Regional HOT Network: U.S. 101 from Whipple to Millbrae – widen for new HOV/HOT lane

Figure I.2-18
Penninsula Corridor



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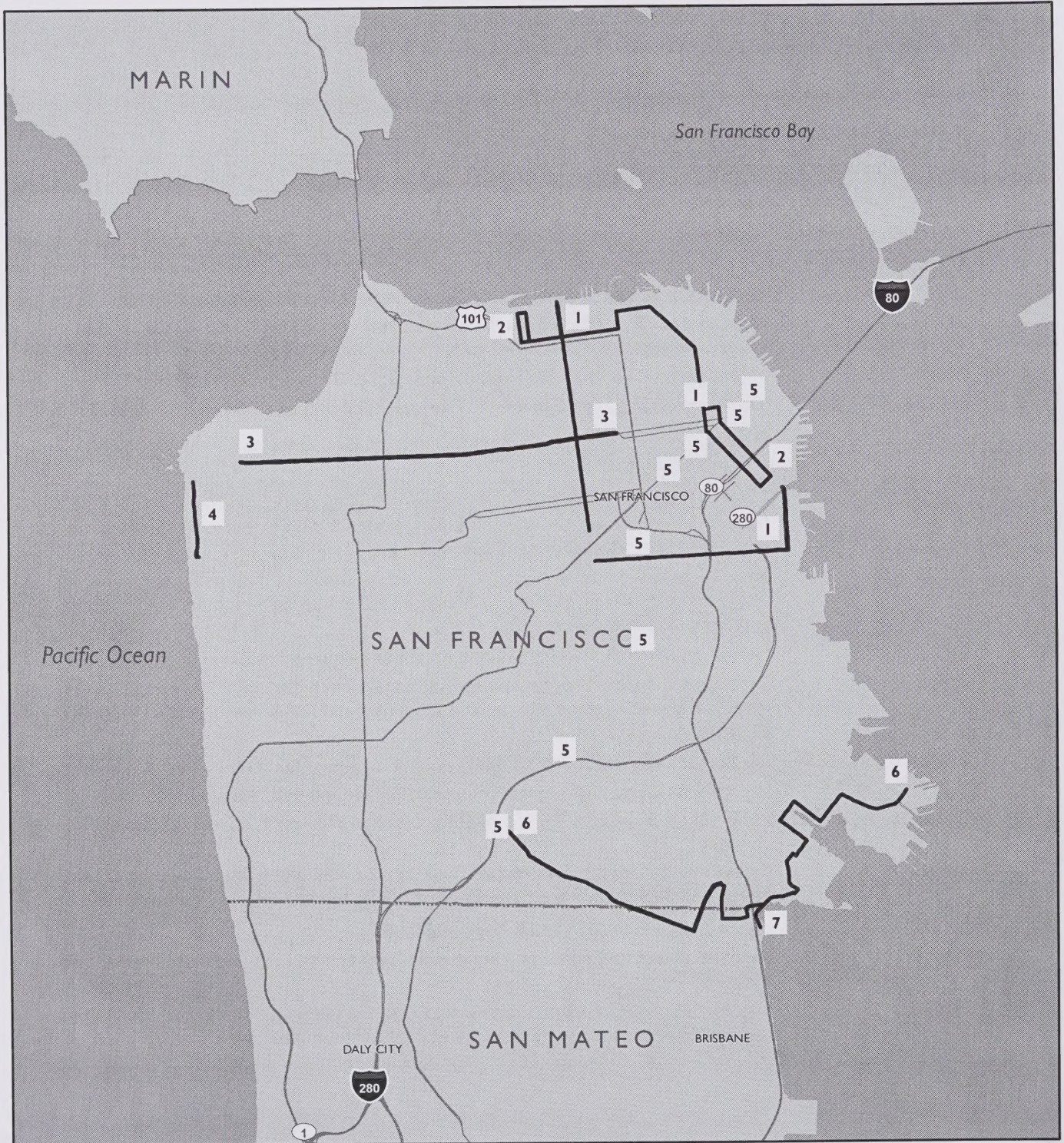
Table 1.2-18: San Francisco Corridor

Note: Committed and programmatic projects are NOT mapped

** Heavy Maintenance/Climate Protection Emphasis Alternatives*

Project ID	Map ID	Description
Financially Constrained Element: Committed Projects		
21342		*Extend Caltrain to Transbay Terminal and replace Transbay Terminal (Phase 1)
21510		*Extend the Third Street Light Rail line from north of King Street to Clay Street in Chinatown via a new Central Subway
22008		Extend Caltrain to Transbay Terminal and replace Transbay Terminal (Phase 2a)
230161		*Implement a Bus Rapid Transit (BRT) project on Van Ness Avenue
230290		Extend Caltrain to Transbay Terminal and replace Transbay Terminal (Phase 2b) (Financially Unconstrained)
Financially Constrained Element: New Commitment Projects		
21502		Implement pedestrian projects, including sidewalk repair, crossing signal, signage improvements and an education campaign
21504		Improve roadways throughout San Francisco by installing new traffic signs and signals, providing new transit lane markings, installing new parking meters and relocating a traffic maintenance shop
21505		*Repair and retrofit local bridge structures and pedestrian overcrossings
22462	2	Implement bicycling programs, including construction and rehabilitation of bicycle lanes and paths; improve signage and crossings; and implement a public awareness campaign
230164	3	Implement a Bus Rapid Transit (BRT) project on Geary Boulevard
230168	4	Improve the Great Highway between Lincoln Way and 48th Avenue
230207	6	Implement a Bus Rapid Transit (BRT) project on the Geneva Avenue/Harney Way corridor
230211	1	Extend trolley coach infrastructure into Mission Bay along 16th Street and Third Street, and implement transit signal priority along 16th Street and Fillmore Street
230490	7	Reconstruct and widen Harney Way to 8 lanes
230517		Improve transit and roadway connectivity between San Francisco and San Mateo counties
230594	5	Improve San Francisco BART stations to enhance passenger safety, accessibility and capacity, improve signage and provide real time transit information

Figure I.2-19
San Francisco Corridor



-  State Highway
-  Interstate Highway
-  United States Highway



0 0.5 1 Miles

Part One: Introduction and Project Description
Chapter 1.2: Overview of the Transportation 2035 Plan

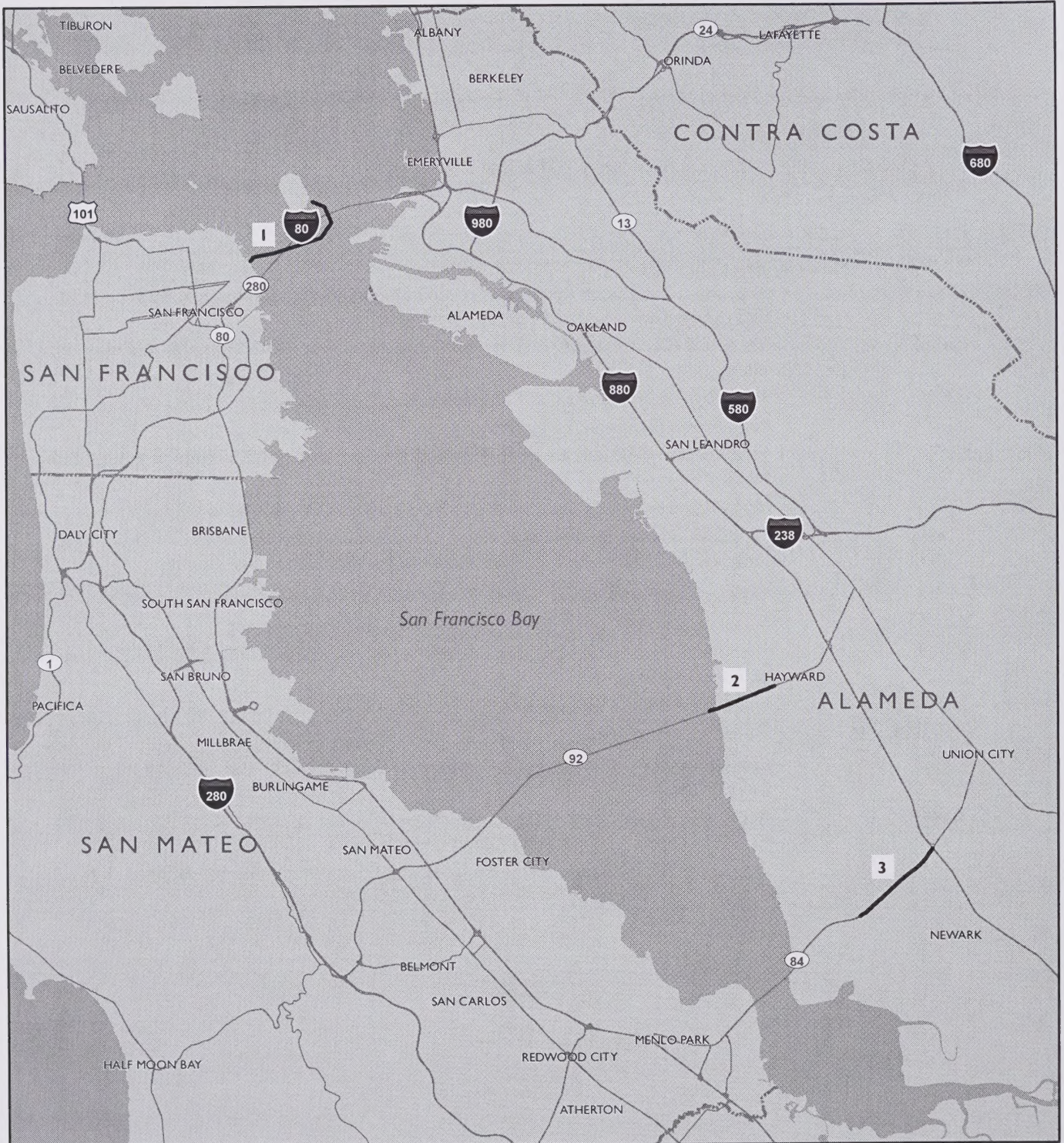
Table 1.2-19: Transbay Corridors

Note: Committed and programmatic projects are NOT mapped

** Heavy Maintenance/Climate Protection Emphasis Alternatives*

<i>Project ID</i>	<i>Map ID</i>	<i>Description</i>
Financially Constrained Element: Committed Projects		
21618		Implement commuter rail service on the Dumbarton Bridge (environmental, design and right-of-way phases) (Financially unconstrained)
22002		*Extend I-880 northbound HOV lane from Maritime Street to the Bay Bridge toll plaza
22120		*Construct ferry terminal at Redwood City
22122		*Implement Richmond Ferry service from Richmond to San Francisco
22509		*Provide ferry service between Alameda/Oakland and San Francisco and between Harbor Bay and San Francisco
22511		*Provide ferry service between Berkeley/Albany and San Francisco
22615		*Improve station facilities and other rail improvements in Redwood City, Menlo Park and East Palo Alto in conjunction with the Dumbarton Rail Corridor
94514		*Reconstruct I-880/Route 92 interchange with direct connectors
230502		*Construct westbound I-580 to northbound U.S. 101 connector
230555		*Reconstruct ramps on the east side of the San Francisco-Oakland Bay Bridge's Yerba Buena Island tunnel
230613		*Implement ferry service between Hercules and San Francisco
Financially Constrained Element: New Commitment Projects		
22512	1	Provide capital improvements to support ferry service between Treasure Island and San Francisco
230672	2	Regional HOT Network: Route 92 from Clawiter through San Mateo-Hayward Bridge toll plaza – convert HOV lanes to HOT lanes
230673	3	Regional HOT Network: Route 84 from I-880 through Dumbarton Bridge toll plaza – convert HOV lanes to HOT lanes

Figure I.2-20
Transbay Corridors



-  State Highway
-  Interstate Highway
-  United States Highway



0 5 10 Miles

New Commitment Projects, Metropolitan Transportation Commission, 2008;
Street base data and county base data, Tele Atlas North America, Inc., 2008.

Part One: Introduction and Project Description
Chapter 1.2: Overview of the Transportation 2035 Plan

Table 1.2-20: Region-Wide Projects

Note: Committed and programmatic projects are NOT mapped

** Heavy Maintenance/Climate Protection Emphasis Alternatives*

Project ID	Map ID	Description
Financially Constrained Element: Committed Projects		
21002		*Implement Freeway Service Patrol, Call Box, and Incident Management Programs
21005		*Fund and implement TransLink®
21006		*Fund and implement Regional Transportation Marketing Program
21008		*Fund and implement 511 Traveler Information
21013		*Rehabilitate state-owned toll bridges in the Bay Area
21015		*Fund Toll Bridge Seismic Retrofit Program
22006		*Improve ferry facilities/equipment including the Downtown Ferry Terminal and procuring additional spare ferry vessels
22240		*Fund Regional Measure 2 Express Bus South improvements
22241		*Fund Regional Measure 2 studies (Water Emergency Transportation Authority environmental studies, I-680/Pleasant Hill BART Connector Study)
22243		*Fund Regional Measure 2 Express Bus North improvements
22244		*Fund City Carshare
22245		*Fund Safe Routes to Transit
22520		*Implement BART earthquake safety program
22636		*Implement BART transbay tube earthquake safety improvements (Phase I)
22991		Widen I-680 southbound in Santa Clara and Alameda counties from Route 237 to Route 84 including an HOV/HOT lane
230336		*Implement recommendations from MTC's Transit Connectivity Study
230649		*High-Speed Rail: fund supporting infrastructure for ACE, BART, Caltrain, MUNI and VTA
Financially Constrained Element: New Commitment Projects		
21011		*Transportation for Livable Communities (TLC): provide planning and capital funds to improve pedestrian, bicycle and transit access and support station development areas and FOCUS Priority Development Areas (PDAs)
21017		*Small transit operators in Alameda, Contra Costa, Napa, Solano and Sonoma counties – transit operating and capital improvement program (including replacement, rehabilitation, and minor enhancements for rolling stock, equipment, fixed facilities and other capital assets; does not include system expansion)
21154		Procure buses for AC Transit Transbay, express and local services
22247		Regional Bicycle Program: provide capital funds to fully build out the Regional Bicycle Network as defined in MTC's Regional Bicycle Master Plan
22423		Lifeline Transportation Program: fund programs and services that address transportation gaps specific to low-income communities
22425		*Planning funds for the Metropolitan Transportation Commission, Association of Bay Area Governments, Bay Conservation and Development Commission, and nine county congestion management agencies

Table I.2-20: Region-Wide Projects

Note: Committed and programmatic projects are NOT mapped

** Heavy Maintenance/Climate Protection Emphasis Alternatives*

Project ID	Map ID	Description
22481		*Caltrain – transit operating and capital improvement program (including replacement, rehabilitation and system enhancements for rolling stock, equipment, fixed facilities and other capital assets); station improvements (e.g., platforms) are included
22676	I	Improve passenger capacity at 43 BART stations
94525		*BART– transit operating and capital improvement program (including replacement, rehabilitation and minor enhancements, equipment, fixed facilities and other capital assets)
94526		*AC Transit – transit operating and capital improvement program (including replacement, rehabilitation and minor enhancements for rolling stock, equipment, fixed facilities and other capital assets; does not include system expansion)
94527		*Livermore Amador Valley Transit Authority (LAVTA) – transit operating and capital improvement program (including replacement, rehabilitation and minor enhancements for rolling stock, equipment, fixed facilities and other capital assets; does not include system expansion)
94558		*Central Contra Costa Transit Authority (CCCTA) – transit operating and capital improvement program (including replacement, rehabilitation, and minor enhancements for rolling stock, equipment, fixed facilities and other capital assets; does not include system expansion)
94572		*Golden Gate Transit – transit operating and capital improvement program (including replacement, rehabilitation and minor enhancements for rolling stock, equipment, fixed facilities and other capital assets; does not include system expansion)
94610		*Valley Transportation Authority (VTA) – transit operating and capital improvement program (including replacement, rehabilitation and minor enhancements for rolling stock, equipment, fixed facilities and other capital assets; does not include system expansion)
94636		*San Francisco Municipal Transportation Agency (Muni) – transit operating and capital improvement program (including replacement, rehabilitation and other minor enhancements for rolling stock, equipment, fixed facilities and other capital assets, does not include system expansion)
94666		*SamTrans – transit operating and capital improvement program (including replacement, rehabilitation and minor enhancements for rolling stock, equipment, fixed facilities and other capital assets; does not include system expansion)
94683		*Vallejo Transit – transit operating and capital improvement program (including replacement, rehabilitation, and minor enhancements for rolling stock, equipment, fixed facilities and other capital assets; does not include system expansion)
230287		*Implement the Bay Area Air Quality Management District's Goods Movement Emission Reductions Project
230419		Freeway Performance Initiative (FPI): maximize freeway performance and reliability using primarily technology and limited expansions at essential locations; includes Traffic Operations System (TOS) infrastructure, TOS maintenance and replacement, arterial coordination and management, and performance monitoring
230550		Transportation Climate Action Campaign: implement a five-year campaign to reduce greenhouse gas emissions; includes funding for a comprehensive outreach and education campaign, Safe Routes to School, Safe Routes to Transit, and Transit Priority

Table 1.2-20: Region-Wide Projects

Note: Committed and programmatic projects are NOT mapped

** Heavy Maintenance/Climate Protection Emphasis Alternatives*

Project ID	Map ID	Description
		Measures (TPMs)
230703		Fund corridor improvements, including transit operating and capital needs, with net HOT revenue

Figure I.2-21
Region-Wide Transportation Projects



Projects in the Financially Constrained Element are shown in **bold**, and projects in the Financially Unconstrained Element are shown in *italics*

-  State Highway
-  Interstate Highway
-  United States Highway



0 10 20 Miles

New Commitment Projects, Metropolitan Transportation Commission, 2008;
Street base data and county base data, Tele Atlas North America, Inc., 2008.

Part Two

Part Two

Settings, Impacts, and Mitigation Measures

Part Two: Settings, Impacts, and Mitigation Measures

INTRODUCTION

Part Two of the EIR contains the settings and analyses of environmental impacts of the proposed Transportation 2035 Plan, as described in *Chapter 1.2*. *Part Two* is organized by issue area. Within each issue area, the environmental setting (both physical and regulatory) is established, significance criteria are presented, analysis methodology is described, and impact analysis is conducted and summarized. For each potentially significant impact, mitigation measures are identified. Impacts of project alternatives are presented and compared in *Chapter 3.1*.

GENERAL METHODOLOGY AND ASSUMPTIONS

In order to assess the effects of the proposed Transportation 2035 Plan, it is necessary to make assumptions about future environmental conditions at the time the Plan is fully implemented. Since implementation of the Plan would occur over 25 years, the horizon year is 2035.

Other key assumptions in the impact analysis include the following:

- The base year or existing conditions for the analysis is 2006, as that is the year for which MTC has the most current validated travel demand model for the transportation network. For comparisons where 2006 data are not available, the closest available year (typically 2005 or 2007) is used.
- ABAG's adopted *Projections 2007* forms the basis for developing future baseline population and employment scenarios for the Proposed Project. See *Chapter 2.11: Growth Inducing Effects* for further details on growth projections.
- The transportation, air quality, energy and climate change and greenhouse gases analyses evaluate the effects of the proposed Transportation 2035 Plan investments assuming the projected population and employment growth in the region and its effect on generating increased travel. Thus, for these issue areas, the travel demand and associated air emissions and energy consumption produced for the proposed project conditions is considered identical to the cumulative condition for CEQA purposes.
- This analysis does not consider phasing of improvements or interim stages of the proposed Transportation 2035 Plan between 2005 and 2035, as the purpose of the analysis is to evaluate the Plan as a whole.
- As a program-level EIR, individual project impacts are not addressed in detail; the focus of this analysis is to address the impacts which, individually or in the aggregate, may be regionally significant.

ORGANIZATION OF IMPACT ANALYSES

Each impact area is analyzed in a separate chapter within *Part Two*. Each chapter is organized as follows:

- **Environmental setting:** both the physical setting or existing conditions and the regulatory setting applicable to the individual issue area;
- **Significance criteria:** the environmental thresholds used as the basis for determining the significance of potential impacts;
- **Method of analysis:** a description of the methodology used to assess impacts within the particular issue area;
- **Summary of impacts:** a brief summary of potential short-term and long-term direct and cumulative effects; and
- **Impacts and mitigation measures:** individually numbered impact statements (including identification of both proposed project and cumulative effects) and corresponding mitigation measures.

IMPACT SIGNIFICANCE

For each issue area, criteria of significance are established, based on normally accepted standards for environmental review and State CEQA Guidelines. Impacts are individually numbered within each issue area and are classified as follows based on the assessment of the impact before applying mitigation:

- **Significant, unavoidable:** cannot be mitigated to a level that is less than significant;
- **Significant, mitigable:** can be mitigated to a level that is less than significant;
- **Less than significant:** does not exceed the significance criteria or threshold; or
- **Beneficial:** results in significant improvement.

Overall cumulative impact use the same significance classification described above; however, the Project's contribution to an overall significant cumulative impact is described as either Cumulatively Considerable or Not Cumulatively Considerable. For each impact that is classified as significant, mitigation measures are recommended. The effectiveness of the recommended mitigation measures is then assessed and the residual impact after mitigation is identified. It is this residual impact that is reported in the *Executive Summary*.

MITIGATION

For some impacts, mitigation measures are commitments by MTC. For other impacts, MTC does not have regulatory or approval authority over the project. In those cases, MTC suggests specific mitigation measures for consideration by project sponsors. Project sponsors shall commit to mitigation measures at the time of certification of their project environmental review document. These commitments obligate project sponsors to implement measures that would minimize or eliminate significant impacts pursuant to CEQA. The project sponsor or local jurisdiction shall be responsible for ensuring adherence to the mitigation measures prior to and during construction of the project. In accordance with "Environmental Guidelines of the Metropolitan Transportation Commission", Resolution 1481 revised July 2008 pursuant to CA Public Resources Code Section 21081.7, MTC shall be provided with status reports of compliance with mitigation measures.

2.1 Transportation

This chapter describes the current transportation conditions and examines the effects of the transportation projects/programs in the proposed Transportation 2035 Plan on travel conditions in 2035. The study area consists of the existing and proposed elements of the transportation system for the nine-county Bay Area, including highways, local roads, rail, bus and ferry transit, and bicycle and pedestrian facilities. This chapter evaluates the impacts related to transportation such as changes in travel times, accessibility (access to jobs), traffic/congestion (vehicle delay and vehicle miles traveled at congested conditions), and vehicle miles traveled per capita that may result from the implementation of the proposed Transportation 2035 Plan.

ENVIRONMENTAL SETTING

PHYSICAL SETTING

Existing Regional Transportation Conditions (2006)

The Bay Area currently contains over 19,600 miles of local streets and roads, and over 1,400 miles of state highways, accommodating nearly 17 million vehicle trips a day. There are over 9,000 transit route miles of service including rapid rail (BART), light rail (e.g. some MUNI lines), commuter rail (Caltrain), diesel and electric buses, cable cars, and ferries. Transit in the Bay Area accommodates 1.6 million boardings a day. The Bay Area also has an extensive local system of bicycle routes and pedestrian facilities (paths and sidewalks). Table 2.1-1 summarizes some basic information about Bay Area travel behavior in 2006.

Cars, buses, and commercial vehicles travel about 145 million miles a day on the Bay Area freeways and local roads (about 20.3 vehicle miles traveled per day per person). Vehicle miles traveled (VMT) is a term used throughout this EIR and refers to the number of vehicle miles traveled within a specified geographic area during a given period of time. One vehicle traveling one mile constitutes one vehicle mile, regardless of its size or the number of passengers. VMT is a common measure of roadway use and economic activity. The region's per capita VMT is the total VMT divided by the population of the Bay Area; basically, it is a measure of the vehicle miles each person travels on average. In general, per capita VMT data correlate with various economic and lifestyle factors such as increased auto ownership, more women in the workforce, more teen driving, and land use patterns.

Delay on Bay Area roads and freeways amounts to over 762,000 hours per weekday, of which 37 percent is considered "non-recurrent" (caused by accidents and breakdowns). Delay is the time difference between travel under congested conditions and travel at posted speed limit. Recurrent delay arises from fluctuations in demand, the manner in which the facility is operated, and physical layout of the roadway. Non-recurrent delay is caused by accidents, vehicle breakdowns, and other random events, such as inclement weather and debris. Non-recurrent delay depends on the nature of the incident: an accident is likely to cause more delay than a vehicle pulled over on the shoulder.

Table 2.1-1: Bay Area Travel Behavior, 2006

Daily Transit Boardings ^a	1,609,000
Daily Vehicle Trips ^b	16,932,000
Daily Vehicle Miles of Travel (VMT) ^b	144,985,000
Daily Vehicle Miles of Travel per Capita	20.3
Daily Vehicle Hours of Recurring Delay ^b	478,000
Daily Vehicle Hours of Non-Recurrent Delay ^c	283,000
Average Delay per Vehicle (Minutes)	2.7

^aDaily transit boardings includes transfer boardings in FY 2006-07
^bIncludes interregional trips
^cIncludes delays from freeway incidents

Source: Metropolitan Transportation Commission Travel Demand Forecasts, 2008

In terms of transportation planning and this EIR, accessibility is a measure of the ease with which a resident can access job opportunities and other activities, such as shopping, school, etc. Access to these “other activities” is also measured by the location of jobs, which is a proxy for various types of activities. Accessibility is calculated as the average number of total jobs within 15, 30 or 45 minutes of the neighborhood-of-residence by mode of transportation. Modes of transportation include drive alone, carpool, transit, bicycle and walk. After the total employment accessible to each neighborhood is obtained, each neighborhood’s accessibility value is weighted by the total population of the neighborhood/zone, and all zones are then summed to derive a regional weighted accessibility value. Higher accessibility values mean better accessibility to jobs, shopping and other opportunities. Remote communities on the periphery of the Bay Area (e.g., Guerneville, Cloverdale, Gilroy) tend to have the lowest accessibility scores.

Of the trips made by Bay Area residents, 23 percent are for work, 27 percent for shopping and other errands, 12 percent for recreation, and 11 percent for school. (Table 2.1-2) The average one-way commute distance for the region is about 12 miles. (Table 2.1-3) San Francisco residents have the shortest average one-way commute distance (7.6 miles), while Solano County residents have the longest average one-way commute distance (15.8 miles).

Table 2.1-2: Average Weekday Daily Person Trips by Purpose, 2006

	2006	% of Total
Work	4,921,000	23%
Shop/Other	5,732,000	27%
Social/Recreation	2,602,000	12%
School	2,385,000	11%
Other ^a	5,648,000	27%
Total	21,287,000	100%

^a“Other” refers to non-home-based trips (such as work-based errands)

Source: Metropolitan Transportation Commission Travel Demand Forecasts, 2008

Table 2.1-3: Average One-Way Commute Distance (in Miles) by County, 2006

<i>County of Residence</i>	<i>Commute Distance</i>
Alameda	12.1
Contra Costa	14.9
Marin	11.5
Napa	12.7
San Francisco	7.6
San Mateo	11.3
Santa Clara	11.7
Solano	15.8
Sonoma	11.4
Regional Average	12.0

Source: Metropolitan Transportation Commission Travel Demand Forecasts, 2008

Travel Trends: Transportation Modes, Travel Time to Work, and Commute Patterns

According to the U.S. Census, Bay Area residents use a range of transportation modes to get to their workplaces, as shown in Table 2.1-4. At the regional level, the share of workers driving alone to work has been fairly constant over the past 16 years. Over the same time period, the share of carpooling commuters declined from 13 percent in 1990 to 10 percent in 2007.

Table 2.1-4: Bay Area Resident Workers by Means of Transportation to Work, 1990-2007

<i>Year</i>	<i>1990</i>	<i>2000</i>	<i>2007</i>
Drive Alone	2,105,000	2,248,000	2,281,000
% of Total	68%	68%	68%
Carpool	400,000	427,000	343,000
% of Total	13%	13%	10%
Transit	294,000	321,000	336,000
% of Total	10%	10%	10%
Walk	112,000	106,000	123,000
% of Total	4%	3%	4%
Other	70,000	72,000	98,000
% of Total	2%	2%	3%
Work at Home	105,000	133,000	175,000
% of Total	3%	4%	5%
Total Workers	3,086,000	3,306,000	3,356,000

Source: U.S. Census 1990 and 2000; American Community Survey 2007

The share of workers commuting by non-automobile modes remained fairly stable between 1990 and 2007. Transit share is still around 10 percent; walking between 3 and 4 percent; and other modes of transport under 3 percent. The largest movement in market share has been the work-at-home share, which increased from 3 percent of all Bay Area workers in 1990 to 5 percent in 2007.

Although the average travel time to work has increased over the past 16 years, it has declined since 2000 (see Table 2.1-5). The average one-way commute duration for the Bay Area increased by 7 percent between 1990 and 2007, from 25.6 minutes in 1990 to 27.4 minutes in 2007. What is notable is that since 2000, there has actually been a 7 percent decline in commute duration. The major downturn in the regional (and national) economy during this period certainly played a significant factor in reducing congestion. Between 2000 and 2007, Alameda and Marin counties each experienced a substantial reduction in travel time to work, 9 and 13 percent respectively.

Table 2.1-5: Average Travel Time to Work, 1990 - 2007

County of Residence	One-Way Trip Duration (minutes)			Change 1990-2007	Change 2000-2007
	1990	2000	2007		
Alameda	25.8	30.8	28.0	9%	-9%
Contra Costa	29.3	34.4	31.8	9%	-8%
Marin	28.4	32.3	28.0	-1%	-13%
Napa	21.4	24.3	25.5	19%	5%
San Francisco	26.9	30.7	29.3	9%	-5%
San Mateo	24.0	27.0	24.9	4%	-8%
Santa Clara	23.3	26.1	24.6	6%	-6%
Solano	28.2	31.8	29.6	5%	-7%
Sonoma	24.1	26.8	25.1	4%	-6%
Bay Area	25.6	29.4	27.4	7%	-7%

Source: U.S. Census 1990 and 2000; American Community Survey 2007

A high proportion of Bay Area residents continue to commute outside their county of residence to jobs in other counties. Table 2.1-6 shows the number of workers who live and work in the same county as well as the number of residents who commuted to other counties for work from 1990 to 2007. In 1990, 26 percent of the region's workers commuted outside their resident county for work. This share has increased to 28 percent by 2007. At the county level, Alameda, San Francisco, San Mateo, Santa Clara, and Solano counties all saw their share of resident workers commuting elsewhere increase between 1990 and 2007. The other counties saw an increasing number of resident workers working in their counties. The decentralization of employment throughout the region offers a partial explanation.

Table 2.1-6: Bay Area Resident Workers Commute Patterns by County, 1990 - 2007

County	Live and Work in Same County			Live Here, Work Elsewhere			% Resident Workers Commuting Out		
	1990	2000	2007	1990	2000	2007	1990	2000	2007
Alameda	446,000	454,000	463,000	187,000	225,000	221,000	30	33	32
Contra Costa	240,000	255,000	288,000	161,000	187,000	186,000	40	42	39
Marin	73,000	79,000	81,000	52,000	48,000	42,000	41	38	34
Napa	38,000	44,000	48,000	13,000	13,000	16,000	26	23	25
San Francisco	307,000	322,000	312,000	75,000	97,000	105,000	20	23	25
San Mateo	202,000	206,000	202,000	145,000	148,000	152,000	42	42	43
Santa Clara	710,000	728,000	722,000	86,000	101,000	111,000	11	12	13
Solano	97,000	99,000	108,000	61,000	75,000	74,000	39	43	40
Sonoma	156,000	184,000	187,000	35,000	41,000	40,000	18	18	18
Bay Area	2,270,000	2,371,000	2,411,000	815,000	935,000	946,000	26	28	28

Source: U.S. Census 1990 and 2000; American Community Survey 2007

REGULATORY SETTING

Federal Statutes

Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) was signed into law in 2005 and reauthorized highway, highway safety, transit, and other surface transportation programs for five years (2005-2009) totaling \$244.1 billion. The two previous landmark bills that brought surface transportation into the 21st century—the Intermodal Surface Transportation Equity Act of 1991 (ISTEA) and the Transportation Equity Act for the 21st Century (TEA-21)—shaped the highway program to meet the Nation's changing transportation needs. SAFETEA-LU builds on this firm foundation, supplying funds and refining the programmatic framework for investments needed to maintain and grow our vital transportation infrastructure. In particular, SAFETEA-LU elevates the importance of improving safety on the nation's highways; gives states more options for using road pricing to address congestion; and, specifies new provisions to strengthen project financial integrity, project delivery, and major project oversight.

Metropolitan Planning General Requirements

Under SAFETEA-LU, the U.S. Department of Transportation (USDOT) requires that Metropolitan Planning Organizations, such as MTC, prepare long-range transportation plans and that these plans be updated every four years. The primary federal requirements regarding RTPs are addressed in the metropolitan transportation planning rules—Title 23 CFR Part 450 and 49 CFR Part 613. Key federal requirements for long range plans include the following:

- RTPs must be developed through an open and inclusive process that ensures public input; seeks out and considers the needs of those traditionally under served by existing transportation systems; and consults with resource agencies to ensure potential problems are discovered early in the RTP planning process;
- RTPs must be developed for a period of not less than 20 years into the future; RTPs must reflect the most recent assumptions for population, travel, land use, congestion, employment, and economic activity;
- RTPs must have a financially constrained element, transportation revenue assumptions must be reasonable, and the long range financial estimate must take into account construction-related inflation costs;
- RTPs may include, for illustrative purposes, additional projects that would be included in the adopted RTP if reasonable additional resources beyond those identified in the financial plan were to become available;
- RTPs must conform to the applicable federal air quality plan, called the State Implementation Plan (SIP), for ozone and other pollutants for which an area is not in attainment¹; and
- RTPs must consider planning factors and strategies in the local context.²

National Environmental Policy Act

The National Environment Policy Act of 1969 (NEPA) requires federal agencies to assess the possible environmental consequences of projects which they propose to undertake, fund, or approve. While the RTP is not subject to NEPA, individual federally funded programs or projects requiring federal approval will be subject to a NEPA evaluation.

State Statutes

The State transportation planning requirements largely mirror the federal requirements. California statute relating to the development of the RTPs is primarily reflected in Government Code Section 65080. MPOs, such as MTC, that are located in nonattainment areas must update their RTPs at least every four years. If the current RTP is determined to be adequate such that an update is not warranted, the MPO may re-adopt the current RTP. The RTP Guidelines require

¹ See MTC's Draft Transportation Air Quality Conformity Analysis for the Transportation 2035 Plan and 2009 Transportation Improvement Program Amendment #09-06 (January 2009) for more information. See also MTC's web page, <http://www.mtc.ca.gov>, for more information about the Air Quality Conformity Task Force meetings and materials related to the federal conformity analysis..

² For more details on the planning factors, see California Transportation Commission, *Regional Transportation Guidelines*, 2007.

that an RTP addresses three distinct elements—a policy element, an action element, and a financial element. In addition, when applicable, RTPs shall be consistent with federal planning and programming requirements and shall conform to the RTP Guidelines adopted by the California Transportation Commission (CTC). The CTC cannot program projects that are not identified in the RTP.

IMPACT ANALYSIS

SIGNIFICANCE CRITERIA

According to CEQA Guidelines, a project will normally have a significant effect if it would cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system or if it would exceed an adopted level of service standard. This definition is somewhat limited for the purposes of a program-level EIR for a regional transportation plan, therefore, a more expansive set of criteria has been defined to determine whether transportation improvements in the proposed Transportation 2035 Plan will have a significant adverse effect on future regional mobility in the Bay Area. Criteria are focused on accessibility, traffic/congestion, and vehicle miles traveled per capita.

Implementation of the proposed Transportation 2035 Plan would have a potentially significant adverse impact if it results in:

- Criterion 1:** A substantial decrease in the average number of jobs within 15, 30, or 45 minutes from home by auto (combines single occupant autos and carpools) or transit compared to existing conditions.
- Criterion 2:** A substantial increase in VMT on facilities experiencing LOS F compared to existing conditions (LOS F defines a condition on roads where traffic substantially exceeds capacity, resulting in stop-and-go conditions for extended periods of time).
- Criterion 3:** A substantial increase in per capita VMT compared to existing conditions.

METHOD OF ANALYSIS

Travel Demand Forecasting Model

The EIR analysis is based on travel projections developed using MTC's travel demand forecasting model. The MTC travel demand model is typical of advanced trip-based models in use in the United States. This model is actually a set of individual models that perform different functions, leading to projections of future Bay Area travel. The models are developed from a database that consists of the MTC 1990 Bay Area Household Travel Survey (BATS 1990) and traffic and transit counts that are used to validate the model results. In spring 2008, available American Community Survey 2006 data were also used in re-validating the various components of the travel models to a 2006 base year. The base year (existing conditions) for the analysis is 2006, which represents the year of the last major travel model validation effort.

Travel demand models are based on a four-step process. These four steps are: trip generation (the amount of travel generated from and attracted to), trip distribution (the share of travel

distributed between different generators and attractors), mode choice (the mode of travel, such as driving, carpooling, transit, walking, bicycling, etc.) and trip assignment (the specific route on which a person trip is made). For modeling and planning, the Bay Area is divided into 1,454 neighborhoods (travel analysis zones).

The MTC travel demand model is enhanced by three additional steps beyond the basic four-step process. These additional steps are auto ownership models (how many cars does a household own?), working household models (do households have workers? If so, how many workers?) and time-of-day models (when do people travel during the day? How many people travel during the peak travel commute period?).

This model produces all of the key outputs used in assessing the significance of transportation impacts, including outputs already described above such as VMT, VHD, and accessibility, as well as other outputs such as volume to capacity ratios and level of service.³

Population, Households, and Employment Forecasts

MTC uses the latest long-term economic-demographic forecasts, *Projections 2007*, adopted by the Association of Bay Area Governments (ABAG). ABAG, as the Bay Area's land use planning agency, is responsible for making long-term forecasts of population, households, and employment, as well as working with local jurisdictions on land use planning issues. *Projections 2007* is the most recent edition of the long-term forecast.⁴ Issued every two years, the forecast is designed to be a realistic assessment of growth in the region that recognizes emerging trends in markets, demographics, and local policies that promote more compact infill development and transit-oriented development. This is particularly the case around fixed transit stations (rail and ferry terminals) and in selected transportation corridors. While these areas will see an increasing proportion of the region's growth, ABAG expects that increase will begin slowly and expand over time.

Key inputs that ABAG provides to MTC for its travel demand model include the number of households, households by income level, number of employed residents, employment by industrial sector, and population by age. These inputs are key drivers for MTC's travel forecasts for auto ownership, trip generation, trip distribution, mode choice, and trip assignment, which are described below.

Assumptions

Underpinning the travel forecasts are a series of key assumptions. These assumptions include, but are not limited to:

³ The volume-to-capacity ratio is a way of describing the level of service experienced by users of a road, which depends on the number of vehicles traveling on the facility and the available capacity. As traffic increases, the V/C ratio rises to a point of saturation where the road cannot carry any more vehicles (a ratio of 1.0 or greater). V/C ratios are also commonly expressed as a range of letters from A to F, with "A" being the least congested, and "F" indicating more traffic than the road's capacity. When V/C is expressed as a letter (A-F), the condition is referred to as level-of-service (LOS).

⁴ For more information about ABAG's Projections 2007, go to: <http://www.abag.ca.gov/planning/currentfcst/proj07.html>

- **Land Use/Demographics.** The land use/demographics (population, housing, jobs, workers, auto ownership, etc.) are based on ABAG's *Projections 2007* as described above.
- **Pricing.** The standard set of pricing assumptions used in MTC travel forecasts relate to auto costs (parking, bridge tolls, auto operating costs, fuel economy) and transit fares. MTC updates its pricing assumptions for each RTP EIR analysis. For the proposed Transportation 2035 Plan, peak and off-peak parking costs per month are estimated for each Bay Area regional travel analysis zone (e.g., parking costs are assumed to attain \$539 per month in today's dollars in San Francisco financial district and \$757 per month in Chinatown). The price of gas in 2035 is estimated at \$7.47 per gallon in today's dollars based on a linear regression of gas prices between April 1998 and April 2008, (versus the \$2.26 per gallon assumed in the Transportation 2030 EIR). Previous RTP EIR analyses did not assume bridge tolls to increase with inflation; for this Transportation 2035 EIR analysis, bridge tolls do keep pace with inflation. The assumption for transit fares has not changed; transit fares keep pace with inflation. MTC uses transit fares in effect as of June 1, 2008.
- **Fuel Economy.** Fleet average fuel economy is 32.2 miles per gallon in 2035 based on AB 1493 (which reflects both Pavley Phase 1 and Phase 2 rules), which is consistent with ARB's Climate Change Proposed Scoping Plan approved on December 11, 2008 (as compared to 21.9 miles per gallon assumed in 2030 in the Transportation 2030 EIR).⁵
- **Transportation Network.** The regional highway network includes all freeways, freeway ramps, expressways, and major arterials in the network representation; and the regional transit networks include all fixed route, inter-zonal transit service, whether by public or private operator.

References

For more information, MTC has a large body of detailed published documentation regarding its travel demand models. This data and other documents can be obtained from the MTC/ABAG Library, or from MTC's home page at <http://www.mtc.ca.gov>. See also MTC's Travel Forecasts Data Summary (December 2008) that details the modeling assumptions and outputs for the proposed Transportation 2035 Plan.

Comparison with the No Project

For purposes of determining the overall significance of impacts, this analysis compares the proposed Project in year 2035 to existing conditions in year 2006. However, the analysis also compares the proposed Project to the 2035 No Project alternative, because the comparison helps identify the contribution of the proposed Transportation 2035 Plan to the cumulative population and employment growth that would affect travel demand on the regional transportation system

⁵ Assembly Bill (AB) 1493 (Chapter 200, Statutes of 2002), known as the "Pavley bill," amended Health and Safety Code sections 42823 and 43018.5 requiring the California Air Resources Board (CARB) to develop and adopt regulations that achieve maximum feasible and cost-effective reduction of Greenhouse Gas (GHG) emissions from passenger vehicles, light-duty trucks, and other vehicles used for noncommercial personal transportation in California. The regulations prescribed by AB 1493 apply to 2009 and later model years. For more information about AB 1493 and the role of fuel efficiency assumptions in the analysis, see *Chapter 2.4: Energy* and *Chapter 2.5: Climate Change and Greenhouse Gases*.

and which are largely independent from proposed Plan policies and investments. The No Project alternative is equivalent to what would occur in the future if the proposed Project were not implemented. For more information on the No Project alternative, please see *Chapter 3.1: Alternatives to the Project*.

FUTURE TRANSPORTATION CONDITIONS (2035)

In order to assess potential impacts, it is necessary to first describe future baseline transportation conditions in terms of projected trips, projected travel modes and vehicle travel, and proposed transportation supply. This future baseline (also known as the No Project) shows the contribution of general regional growth and development trends to the overall cumulative transportation impacts that are evaluated in this chapter.

Also presented here is a comparison of the proposed Project to the future baseline and existing conditions in terms of some important model inputs and outputs that are not depicted in the impact analysis tables later on. These indicators are not presented as separate impact analyses because the conclusions would be redundant, but they facilitate understanding of the analyses and conclusions and thus are included here for transparency. The common thread throughout the comparisons is that the proposed Project provides more transit and roadway capacity than the No Project alternative, and thus performs better across several kinds of transportation indicators. Details about the No Project comparison are provided in *Chapter 3.1: Alternatives to the Project*.

Growth in Vehicle Trips

As shown in Table 2.1-7, as defined by ABAG's *Projections 2007*, projected population will grow by 26 percent, employment will grow by 50 percent, and mean household income will increase by 29 percent in the Bay Area over the next 25 years. This will lead to increases in the number of trips made by persons traveling in the Bay Area (called person trips); and due to the rise in income levels, the total number of vehicles available per household also increases. These trips are made for a variety of purposes as shown in Table 2.1-8. Overall, a 36 percent increase in daily person trips is projected between 2006 and 2035. This growth rate is higher than population growth, projected at 26 percent, but lower than the growth in employment (50 percent). Home-based work trips are projected to increase at the fastest rate (52 percent). As with the movement of people, the number of commercial truck trips (which includes heavy trucks and 4-tire service delivery trucks) will also increase to serve both the new population and additional freight needs of a growing economy. These trips are estimated to increase by 45 percent.

Table 2.1-7: Bay Area Population, Employment, and Vehicle Availability (2006 to 2035)

	2006	2035	Change	
			Numerical	Percent
Demographic Characteristics				
Total Population	7,159,000	9,031,000	1,872,000	26%
Employed Residents	3,282,000	5,017,000	1,734,000	53%
Total Employment	3,499,000	5,248,000	1,749,000	50%
Mean Household Income (2007\$)	103,000	133,000	30,000	29%
Regional Households by Vehicle Availability Level				
Zero-Vehicle Households	243,000	312,000	69,000	29%
Total Vehicles in Households	4,650,000	5,912,000	1,262,000	27%
Average Vehicles in Households	1.78	1.80	0.02	1.1%

Source: Metropolitan Transportation Commission, 2008

Table 2.1-8: Growth in Daily Regional Vehicle Trips

	2006	2035	2035	Change 2006 to 2035 Project		Change 2035 No Project to 2035 Project		
		No Project	Project	Numerical	Percent	Numerical	Percent	
Trip Purpose								
Home-based Work	3,803,000	5,785,000	5,767,000	1,964,000	52%	-18,000	-0.3%	
Home-based Shop/Other	3,673,000	4,664,000	4,650,000	977,000	27%	-14,000	-0.3%	
Home-based Social/Recreation	1,407,000	1,754,000	1,752,000	345,000	25%	-2,000	-0.1%	
Home-based School	399,000	404,000	408,000	9,000	2%	4,000	1.0%	
Non-Home Based	3,835,000	5,221,000	5,216,000	1,381,000	36%	-5,000	-0.1%	
Sub-Total, Intraregional Personal Travel	13,118,000	17,828,000	17,793,000	4,675,000	36%	-35,000	-0.2%	
Commercial	3,241,000	4,689,000	4,689,000	1,448,000	45%	0	0.0%	
Inter-regional	572,000	765,000	765,000	193,000	34%	0	0.0%	
Total	16,932,000	23,282,000	23,246,000	6,314,000	37%	-36,000	-0.2%	

Source: Metropolitan Transportation Commission, 2008

Projected Changes in Transportation Mode and Vehicle Travel

As discussed above, the provision of transportation system capacity improvements in specific corridors will affect traffic levels on regional facilities and the use of Bay Area transit systems. Table 2.1-9 provides measures of regional travel activity for 2035, as forecasted by MTC. Compared to existing conditions, the implementation of the proposed Project results in a 32 percent increase in trips by auto but trips by alternative modes grow by a much higher percentage—81 percent increase in trips by transit, 48 percent increase in trips by bicycling, and 51 percent increase in trips by walking.

Table 2.1-9: Projected Changes in Travel Behavior

	2006	2035	2035	Change 2006 to 2035 Project		Change 2035 No Project v 2035 Project	
		No Project	Project	Numerical	Percent	Numerical	Percent
Daily Trips by Means of Transportation ^a							
Auto ^b	17,611,000	23,331,000	23,267,000	5,656,000	32%	-64,000	-0.3%
Transit	1,106,000	1,938,000	2,007,000	901,000	81%	70,000	4%
Bicycle	377,000	558,000	557,000	180,000	48%	-1,000	-0.2%
Walk	2,193,000	3,322,000	3,317,000	1,124,000	51%	-5,000	-0.1%
Total	21,287,000	29,148,000	29,148,000	7,861,000	37%	0	0%
Share of Trips by Means of Transportation							
Auto	83%	80%	80%				
Transit	5%	7%	7%				
Bicycle	2%	2%	2%				
Walk	10%	11%	11%				
Total	100%	100%	100%				
Daily Transit Boardings ^c	1,609,000	2,887,000	3,030,000	1,421,000	88%	143,000	5%
Daily Vehicle Trips ^d	16,932,000	23,282,000	23,246,000	6,314,000	37%	-36,000	-0.2%
Daily VMT	144,985,000	192,302,000	191,456,000	46,470,000	32%	-846,000	-0.4%
Daily VHD	762,000	1,789,000	1,153,000	392,000	51%	-636,000	-36%
Average Daily Delay per Vehicle Trip (Minutes)	2.7	4.6	3.0	0.3	11%	-1.6	-35%

^a Excludes commercial and interregional trips

^b Includes single-occupant and carpool auto trips; 2-person carpool is counted as two auto trips

^c Daily transit boardings includes transfer boardings

^d Includes interregional trips; 2-person carpool is counted as one vehicle trip

Source: Metropolitan Transportation Commission, 2008

Overall, when comparing the proposed Project to existing conditions, daily transit use increases by 88 percent, daily vehicle trips increase by 37 percent, and daily vehicle miles traveled (VMT) increase by 32 percent. The increases in regional travel activity, however, are not caused by the implementation of the proposed Project but rather by regional growth in population, jobs,

workers, average household income, and auto ownership rates. This is clear because trips, VMT, VHD, and average delay per trip are all even higher under the No Project alternative. When compared to the No Project alternative, the proposed Project shows 5 percent more daily transit use, 0.2 percent less daily vehicle trips, 0.4 percent fewer VMT, 36 percent fewer daily VHD, and 35 percent shorter average daily delay per vehicle trip. The relative improvement under the proposed Project is largely a result of proposed investment in transit and roadway capacity increases.

Proposed Transportation System Capacity Increases (Supply)

The proposed Transportation 2035 Plan consists of funding for transit, local roadway and State highway maintenance and operations; system management and efficiency programs such as the Freeway Performance Initiative, Transportation Climate Action Campaign, Regional Bicycle Program, Transportation for Livable Communities, and Lifeline Transportation Program; and various system expansion projects throughout the region, as described in Chapter 1.2. Maintenance and operations projects will not affect people's travel behavior, and system efficiency programs (other than the Freeway Performance Initiative that directly impacts freeway operations) will affect travel behavior in subtle and localized ways that are generally difficult to assess in a regional analysis. Projects that expand transportation system capacity will be responsible for the greatest impact on travel behavior and are therefore given the bulk of the attention in this EIR analysis.

Table 2.1-10 provides a measure of the relative level of expansion contemplated in the proposed Transportation 2035 Plan. The existing road network (2006 conditions) is composed of about 20,310 miles, with roughly 23 percent of those miles on freeways and roughly 77 percent on expressways and arterials. Compared to existing conditions, the proposed Project adds six percent to total roadway lane miles (1,120 lane miles). However, the relative share of freeways and expressways to arterials stays at a similar ratio in 2035. Although the implementation of the Regional HOT Network results in a 110 percent increase (an additional 400 miles) in HOV/HOT freeway lanes, the vast majority (75 percent) of road miles remain arterials and expressways.

Transit seat miles, a measure of transit capacity, are the miles that transit vehicles travel multiplied by the number of seats in each vehicle. The existing transit network (2006 conditions) consists of three dominant modes: bus (37 percent of seat miles), rapid rail (e.g. BART, 31 percent of seat miles), and commuter rail (e.g. Caltrain, 23 percent of seat miles). Transit seat miles per hour during the morning peak will increase by 18 percent from existing conditions due to the transit investments in the proposed Transportation 2035 Plan (such as MTC's Resolution 3434 regional transit expansion investments). The largest increases in seat miles in the proposed Project are for rapid rail transit which adds 372,000 miles from 2006 conditions (a 35 percent increase), ferry transit which adds 100,000 seat miles (an 85 percent increase) and bus transit which adds 63,000 miles (a 5 percent increase). These capacity expansions are a result of more frequent service and new routes.

Table 2.1-10: Roadway Lane Miles and Transit Seat Miles (2006 to 2035)

	2035		2035 Project	Change 2006 to 2035 Project		Change 2035 No Project v 2035 Project	
	2006	No Project		Numerical	Percent	Numerical	Percent
Freeways							
Mixed Flow	4,370	4,480	4,530	160	4%	50	1%
HOV/HOT	380	520	790	410	110%	270	53%
Expressways							
Mixed Flow	910	1,010	1,070	160	17%	60	6%
HOV	50	40	50	0	2%	0	9%
Arterial / Other	14,610	14,900	15,000	390	3%	100	0.7%
Roadway Lane Miles Total	20,310	20,950	21,430	1,120	6%	480	2%
Bus Transit	1,262,000	1,295,000	1,325,000	63,000	5%	30,000	2%
Light Rail Transit	203,000	220,000	225,000	22,000	11%	5,000	2%
Rapid Rail Transit	1,048,000	1,241,000	1,420,000	372,000	35%	179,000	14%
Commuter Rail Transit	793,000	653,000	835,000	42,000	5%	182,000	28%
Ferry Transit	117,000	211,000	218,000	100,000	85%	7,000	3%
Transit Seat Miles Total	3,423,000	3,621,000	4,024,000	600,000	18%	403,000	11%

¹AM peak period passenger seat miles per hour

Source: Metropolitan Transportation Commission, 2008

Projected Changes in Average Travel Time

As shown in Table 2.1-11, future growth and land use patterns, coupled with growth in regional travel activity and the transportation investments in the proposed Project, would result in a slight decrease in average travel time for work trips (0.9 minute less, or a 4 percent decrease) and for truck trips (0.1 minute less, or 1 percent decrease) but no change for non-work trips when compared to existing conditions. However, the transportation investments in the proposed Project provide a more dramatic improvement when compared to the No Project alternative. Here, the proposed Project provides an overall reduction in average travel time per trip for all trips – 10 percent reduction (2.5 minutes less) for work trips, 6 percent reduction (0.9 minute less) for non-work trips, and 5 percent reduction (0.4 minute less) for truck trips.

Table 2.1-11: Average Travel Time Per Vehicle Trip (2006 to 2035, in minutes)

	2006	2035	2035	Change 2006 to 2035 Project		Change 2035 No Project v 2035 Project	
		No Project	Project	Numerical	Percent	Numerical	Percent
Personal Trips, Total ^a	15.9	17.4	16.5	0.6	4%	-0.9	-5%
Work Trips, Total	22.7	24.3	22.7	0.0	0%	-1.6	-6%
Non-Work Trips, Total ^b	13.2	14.1	13.5	0.4	3%	-0.6	-4%
Truck Trips, Total	8.5	8.8	8.6	0.1	2%	-0.2	-3%

^a Personal trips is comprised of all work and non-work trips

^b Non-work trips include home-based shop/other, social/recreation, school, and non-home based trips

Source: Metropolitan Transportation Commission, 2008

Projected Changes in Daily Vehicle Trips

Forecasted daily vehicle trips in the Bay Area will increase by about 36 percent from 2006 to 2035 due to significant job and population growth in the region. Santa Clara, Alameda and Contra Costa counties show the largest absolute growth in vehicle trips over this period (see Table 2.1-12). However, the proposed Project will reduce vehicle trips by 0.3 percent (51,000 less vehicle trips) compared to the No Project alternative, primarily due to increase transit, bike, and pedestrian capacity. Significant decreases in vehicle trips are evident in a number of counties-of-origin, most notably: San Francisco County (14,000 less vehicle trips in the proposed Project), Santa Clara County (12,000 less vehicle trips in the proposed Project), and Alameda County (12,000 less vehicle trips in the proposed Project).

Table 2.1-12: Average Weekday Daily Vehicle Trips¹ by County-of-Origin

	2006	2035		Change 2006 to 2035 Project		Change 2035 No Project to 2035 Project	
		No Project	Project	Numerical	Percent	Numerical	Percent
San Francisco	1,036,000	1,275,000	1,262,000	226,000	22%	-14,000	-1%
San Mateo	1,524,000	2,044,000	2,040,000	517,000	34%	-4,000	-0.2%
Santa Clara	3,646,000	5,102,000	5,091,000	1,445,000	40%	-12,000	-0.2%
Alameda	2,597,000	3,508,000	3,496,000	899,000	35%	-12,000	-0.3%
Contra Costa	1,863,000	2,621,000	2,618,000	755,000	41%	-3,000	-0.1%
Solano	735,000	1,057,000	1,055,000	320,000	43%	-2,000	-0.2%
Napa	261,000	338,000	338,000	76,000	29%	0	-0.1%
Sonoma	919,000	1,253,000	1,251,000	333,000	36%	-2,000	-0.1%
Marin	543,000	635,000	632,000	89,000	16%	-3,000	-0.4%
Region Total	13,123,000	17,834,000	17,783,000	4,659,000	36%	-51,000	-0.3%

¹Average weekday daily vehicle trips include intra-regional personal travel and exclude inter-regional and truck trips.

Source: Metropolitan Transportation Commission, 2008

Projected Changes in Daily Vehicle Hours of Delay

Table 2.1-13 displays vehicle hours of delay by type of travel (i.e., freeways versus arterials and expressways) and by whether the delay is recurrent or non-recurrent. Overall, total vehicle hours of delay increases with or without the proposed Project. Under the proposed Project, arterials and expressways will experience a larger increase in recurrent vehicle hours of delay relative to freeways (120 percent increase compared to a 41 percent increase). Non-recurrent delay on freeways will increase by 34 percent over existing conditions assuming implementation of the proposed Project. However, the proposed Project would reduce hours of delay relative to the No Project alternative by up to 35 percent annual vehicle hours of delay per capita.

Table 2.1-13: Daily Vehicles Hours of Delay (VHD)¹

	2006		2035		Change 2006 to 2035 Project		Change 2035 No Project to 2035 Project	
		No Project		Project	Numerical	Percent	Numerical	Percent
Recurrent VHD								
Freeways	350,000	848,000	494,000	143,000	41%	-354,000	-42%	
Arterials and Expressways	128,000	358,000	281,000	153,000	120%	-73,000	-21%	
Total	478,000	1,201,000	774,000	296,000	62%	-427,000	-36%	
Freeway Non-recurrent VHD	283,000	588,000	379,000	95,000	34%	-209,000	-36%	
VHD, Total	762,000	1,789,000	1,153,000	392,000	51%	-636,000	-36%	
Annual VHD Per Capita	39	72	47	27	20%	-26	-35%	

¹ Excludes intra-zonal trips

Source: Metropolitan Transportation Commission, 2008

SUMMARY OF IMPACTS

The transportation investments in the proposed Project, together with regional growth anticipated in ABAG's *Projections 2007*, would improve accessibility to jobs by both auto and transit modes for all time intervals of 15, 30, and 45 minutes compared to existing conditions. However, also due to projected regional growth that generates demand for travel, vehicle miles traveled at congested conditions and vehicle miles traveled per capita would increase over existing conditions despite transportation investments in the proposed Transportation 2035 Plan.

These impacts on job accessibility, congestion, and VMT per capita are cumulative impacts because they are the product of many factors including regional population growth, housing and commercial development, land use regulations, and wider state and national economic and social trends that influence where people want to live and work. Implementation of the proposed Transportation 2035 Plan is just one piece of this puzzle. When compared to the No Project alternative, the proposed Project provides improvements across all transportation significance criteria—it improves accessibility to jobs by autos and transit, reduces vehicle miles of travel at LOS F for all facilities, and reduces VMT per capita.

Implementation of projects in the proposed Transportation 2035 Plan will be phased over many years, so local impacts will be different from year to year. As projects advance from planning into implementation, short-term impacts, such as delays to travelers, would be created by congestion in and around construction zones. At a regional and programmatic level over the entire planning period, the sum of these discrete short-term effects are considered less-than-significant. However, large numbers of construction projects occurring at the same time, or one local area experiencing construction of many projects consecutively, could result in localized delay impacts that are significant. These must be evaluated at the project level as more information about the timing, design, scope, and construction program are available.

IMPACTS AND MITIGATION MEASURES

Cumulative Impact

2.1-1 Accessibility to jobs by both auto and transit modes for all time intervals of 15, 30 and 45 minutes would improve compared to existing conditions. (*Beneficial*)

Projected changes in accessibility from 2006 to 2035 are the result of three factors: (1) increased job growth relative to population growth, (2) changing geographic relationships between the locations of jobs and housing in the region, and (3) the effects of the transportation investments in the proposed Project. Compared to existing conditions, accessibility to total jobs would greatly increase for both auto and transit users under the proposed Project, as shown in Table 2.1-12. The increase in auto and transit accessibility is primarily related to the shift in where people live in relation to their jobs. ABAG's *Projections 2007* show that in 2035 the highest net residential densities are concentrated in the urban core areas of San Francisco, Alameda, and Santa Clara counties and highest employment densities are in the same three counties plus San Mateo County. As shown in Table 2.1-14, comparing the proposed Project to existing conditions shows that the proposed Project results in a significant improvement in accessibility for autos (e.g., 39 percent increase in the number of total jobs accessible by auto within 15 minutes) and a more significant improvement in accessibility for transit users (e.g., 86 percent increase in the number

of total jobs accessible by transit within 15 minutes)—given the 18 percent increase in the regional transit supply in the proposed Project.

Accessibility to jobs by autos and transit would continue to improve with the implementation of the investments in the proposed Project compared to the No Project alternative. The number of jobs accessible by auto within 15 minutes and 30 minutes improves by 1 percent each, and the number of jobs accessible by transit within 15 minutes, 30 minutes and 45 minutes improves by 14 percent, 12 percent and 7 percent, respectively.

Table 2.1-14: Accessibility to Jobs (2006 to 2035)

	2035		2035 Project	Change 2006 to 2035 Project		Change 2035 No Project to 2035 Project	
	2006	No Project		Numerical	Percent	Numerical	Percent
Number of Total Jobs Accessible by Auto							
Within 15 minutes	110,000	150,000	152,000	42,000	39%	2,000	1%
Within 30 minutes	454,000	586,000	590,000	136,000	30%	4,000	1%
Within 45 minutes	950,000	1,159,000	1,161,000	211,000	22%	2,000	0%
Number of Total Jobs Accessible by Transit							
Within 15 minutes	6,000	9,000	11,000	5,000	86%	1,000	14%
Within 30 minutes	46,000	73,000	81,000	35,000	77%	8,000	12%
Within 45 minutes	139,000	213,000	228,000	89,000	64%	15,000	7%

Source: Metropolitan Transportation Commission, 2008

Mitigation Measures

None required.

Cumulative Impact

2.1-2 Vehicle miles traveled at Level of Service F would increase for both freeways and expressways and arterial facilities when compared to existing conditions. (*Significant Cumulative Impact, Contribution Not Cumulatively Considerable*)

The EIR evaluates the change in the amount of automobile travel on facilities experiencing the worst level of service, and the hours of congestion experienced by motorists. Table 2.1-15 displays vehicle miles of travel by type of travel (i.e., freeways versus arterials and expressways) and volume-to-capacity ratio (V/C).

Overall, total regional VMT during the morning (AM) peak period is projected to increase by 27 percent by the year 2035, compared to existing conditions (see Table 2.1-17). The amount of VMT at LOS F (severe congestion) for all facilities would increase 149 percent between 2006 and 2035. These worsening roadway traffic service levels reflect the additional travel generated from future population and employment growth.

However, relative to the No Project alternative, the implementation of the proposed Project will reduce the amount of VMT at LOS F by 41 percent for all facilities. Thus, the proposed

Transportation 2035 Plan would represent a substantial improvement over the No Project alternative. Relative to the overall significant cumulative impact, the proposed Project's contribution to the impact is not cumulatively considerable.

Table 2.1-15: AM Peak Period Regional Vehicle Miles Traveled (VMT) by Facility Type and Volume to Capacity (V/C) Ratio (2006 to 2035)

V/C Ratio	LOS	2006	2035	2035	Change 2006 to 2035 Project		Change 2035 No Project to 2035 Project	
			No Project	Project	Numerical	Percent	Numerical	Percent
Freeways								
< 0.75	A-C	12,018,000	9,166,000	11,104,000	-914,000	-8%	1,937,000	21%
0.75 to 1.00	D-E	9,805,000	13,544,000	14,455,000	4,650,000	47%	911,000	7%
> 1.00	F	1,360,000	5,506,000	3,106,000	1,745,000	128%	-2,400,000	-44%
Total		23,183,000	28,217,000	28,664,000	5,481,000	24%	448,000	2%
Expressways and Arterials								
< 0.75	A-C	10,774,000	13,427,000	13,135,000	2,361,000	22%	-292,000	-2%
0.75 to 1.00	D-E	1,672,000	3,461,000	3,158,000	1,487,000	89%	-302,000	-9%
> 1.00	F	127,000	738,000	598,000	471,000	370%	-141,000	-19%
Total		12,573,000	17,626,000	16,891,000	4,318,000	34%	-735,000	-4%
All Facilities								
< 0.75	A-C	22,792,000	22,593,000	24,239,000	1,447,000	6%	1,645,000	7%
0.75 to 1.00	D-E	11,477,000	17,005,000	17,613,000	6,136,000	53%	608,000	4%
> 1.00	F	1,488,000	6,244,000	3,703,000	2,216,000	149%	-2,541,000	-41%
Total		35,756,000	45,843,000	45,555,000	9,799,000	27%	-287,000	-1%

¹AM peak period is four hours.

²Freeways include Freeways and Freeway-to-Freeway connectors. Expressways and Arterials include all other facilities.

³LOS - Level of Service measures traffic density in a range of A to F.

⁴LOS A are free-flow conditions with no delay; LOS D-E are more congested conditions with some delay possible; LOS F represents conditions of over-capacity and significant delay.

Source: Metropolitan Transportation Commission, 2008

MTC recognizes the challenges associated with reducing VHD and VMT overall in a region that continues to grow in both population and jobs. Therefore, in partnership with ABAG, BCDC, and BAAQMD (as represented through the Joint Policy Committee (JPC) which coordinates the regional planning efforts of the four agencies), as well as with Caltrans, local jurisdictions and other partners, MTC has already committed to working together to implement:

- Faster delivery of the Freeway Performance Initiative (which has a \$1.6 billion funding commitment in the proposed Transportation 2035 Plan) in order to reduce vehicle hours of delay and traffic congestion on Bay Area freeways and improve traffic operations on parallel arterials; and

- MTC's existing TOD Policy, a policy that conditions the allocation of regional discretionary funds on supportive local land use plans and policies for transit expansion projects included in the Resolution 3434 Regional Transit Expansion program.
- Multi-agency FOCUS program, a regional development and conservation strategy that promotes a more compact land use pattern for the Bay Area. FOCUS unites the efforts of four regional agencies into a single program that links land use and transportation by encouraging the development of complete, livable communities in areas served by transit, and promotes conservation of the region's most significant resource lands.

Nonetheless, additional mitigation is proposed here to further reduce the cumulative impact related to vehicle miles traveled at LOS F.

Mitigation Measures

2.1(a) MTC, ABAG, BCDC and BAAQMD—as represented through the Joint Policy Committee (JPC) which coordinates the regional planning efforts of the four agencies—shall work to leverage existing funds (including the \$2.2 billion in funds committed in the proposed Transportation 2035 Plan for the Transportation for Livable Communities Program) and seek additional funds to provide financial incentives to local governments that volunteered to designate their communities as Priority Development Areas (PDAs) through the FOCUS program and commit to build higher density residential and mixed use development near transit.

2.1(b) MTC, in partnership with ABAG, BCDC, BAAQMD, local governments, and employers who would like to participate, will seek opportunities to conduct research on and promote value pricing of parking and other innovative parking strategies, for example:

- Employer parking “cash out” programs, which allow employees to forego a parking spot in favor of cash or a subsidized transit pass;
- Residential parking “opt-out” programs, which reduce city parking requirements in favor of developer funded cash to residents and/or transit passes, carshare membership, bicycle rentals, or alternative modes;
- Local parking self-financing programs, which price parking to fund transit passes, alternative modes, and/or provide cash directly to workers and residents;
- “Green certification” of local parking policy regulations aimed at reducing vehicle miles traveled; and
- Technical assistance programs to remove barriers that prevent local governments from implementing parking pricing programs.

2.1(c) MTC shall advocate to State and federal legislators for new incentive funding for local governments to take steps to encourage higher density and mixed use developments near transit, including strategies such as (a) revising land use plans and zoning codes to remove barriers that may prevent such development; or (b) providing incentives to developers through density bonuses or expedited development review.

Despite feasible mitigation, the overall cumulative impact is assumed to remain significant and unavoidable. However, the proposed Project's contribution to the overall significant cumulative impact is not cumulatively considerable.

Cumulative Impact

2.1-3 Average weekday vehicle miles travelled per capita would increase slightly compared to existing conditions. (*Less than Significant*)

As shown on Table 2.1-16, projected per capita VMT will increase slightly by 4.4 percent (from 20.3 to 21.3) by year 2035 relative to existing conditions due in large part to the cumulative impact of projected regional growth in population and jobs in the Bay Area. Other key factors that contribute to this trend can be attributed to ABAG's *Projections 2007* which forecast that (1) the region will continue to build traditional, auto-oriented developments though some places will start to have new developments where people can drive shorter distances, take transit and/or walk; and (2) both household incomes and auto ownership rates rise significantly over time.

However, the proposed Project provides a slight improvement (0.5 percent reduction) in per capita VMT over the No Project alternative due to transportation investments in the proposed Plan (including investments in transit expansion, bicycle and pedestrian projects, and land use programs like the Transportation for Livable Communities program). Thus, relative to the overall impact, the proposed Project's contribution is not cumulatively considerable.

Table 2.1-16 Daily Vehicle Miles of Travel Per Capita (2006 to 2035)

	2006	2035 No Project	2035 Project	Change 2006 to 2035 Project		Change 2035 No Project to 2035 Project	
				Numerical	Percent	Numerical	Percent
Per Capita VMT	20.3	21.3	21.2	0.9	4.4%	-0.1	-0.5%

Source: Metropolitan Transportation Commission, 2008

Mitigation Measures

None required.

2.2 Air Quality

This chapter evaluates the regional air quality impacts of implementing the proposed Transportation 2035 Plan. The analysis focuses on the following criteria pollutants: (1) ground-level ozone wherein the Bay Area is currently designated as a non-attainment area under the national and state standards, (2) particulate matter wherein the Bay Area is currently designated as non-attainment under the state standards; and (3) carbon monoxide wherein the Bay Area is designated as attainment under the national standard. It also evaluates the regional impacts of toxic air contaminants (TACs), which refer to pollutants that occur in relatively low concentrations and can have adverse health impacts, but for which no ambient air quality standards have been established. Further, it looks at regional air quality impacts associated with construction activities.

This EIR does not examine localized air quality effects of specific transportation improvements in the Transportation 2035 Plan, such as concentrations of carbon monoxide and particulate matter. These pollutants will be examined in subsequent project-level CEQA/NEPA environmental documents, which will be prepared by project sponsors in order to approve the individual projects.

The related issues of greenhouse gas emissions and potential climate change effects are addressed separately in *Chapter 2.5* of this EIR.

ENVIRONMENTAL SETTING

PHYSICAL SETTING

Air quality is affected by the rate, amount, and location of pollutant emissions, and the associated meteorological conditions that influence pollutant movement and dispersal. Atmospheric conditions, including wind speed, wind direction, and air temperature, in combination with local surface topography (i.e., geographic features such as mountains and valleys), determine the effect of air pollutant emissions on local air quality.

Climate, Meteorology, and Topography

Wet winters and dry summers characterize the region's Mediterranean climate. Rainfall totals can vary widely over a short distance, with windward coastal mountain areas receiving over 40 inches of rain, while leeward areas receive about 15 inches. During rainy periods, horizontal and vertical air movement ensures rapid pollutant dispersal. Rain also washes out particulate and other pollutants.

Regional wind patterns vary from season to season. Wind tends to move from areas of high-pressure to areas of low-pressure. In warmer months, this means that air currents move on-shore from the Pacific Ocean to inland areas. While Pacific Ocean air is generally free of harmful air pollutants, it receives emissions from numerous sources (anthropogenic and biogenic), and will then carry these pollutants to areas many miles away. Mountains and valleys often affect on-shore winds. This means that a wind pattern that started as northwesterly will often swing 90 degrees or more when it encounters topographic features.

Normally, air temperatures decrease with increasing elevations. Sometimes this normal pattern is inverted, with warmer air aloft, and cool air trapped near the earth's surface. This phenomenon occurs in all seasons. In summer, especially when wind speeds are very low, a strong inversion will trap air emissions and high levels of ozone smog can occur. In winter, a strong inversion can trap emissions of particulate and carbon monoxide near the surface, resulting in unhealthy air quality.

The Bay Area topography is complex, consisting of coastal mountain ranges, inland valleys, and bays. The Pacific Ocean bounds the area to the west with warmer inland valleys to the south and east. The only major break in California's Coast Range occurs at San Francisco Bay. The gap on the western side is called the Golden Gate, and on the eastern side is called the Carquinez Strait. These gaps allow air to pass between the Central Valley and the Pacific Ocean. The general region lies in the semi-permanent high-pressure zone of the eastern Pacific, resulting in a mild climate tempered by cool sea breezes with light average wind speeds. The usually mild climatological pattern is interrupted occasionally by periods of extremely hot weather, winter storms, and offshore winds.

The climatological pollution potential of an area is largely dependent on winds, atmospheric stability, solar radiation, and terrain. The combination of low wind speeds and low inversions produces the greatest concentration of air pollutants. On days without inversions, or on days of winds averaging over 15 miles per hour (mph), smog potential is greatly reduced. Because of wind patterns, and to a lesser degree the geographic location of emission sources, high ozone levels usually occur in inland valleys, such as the Livermore area. High particulate matter levels can occur in areas of intense motor vehicle use, such as freeways, ports, etc., and in most valley areas where residential wood smoke and other pollutants are trapped by inversions and stagnant air.

Existing Air Quality and Attainment Status Summary

The Clean Air Act requires EPA to set National Ambient Air Quality Standards (NAAQS) (40 CFR part 5) for six pollutants considered harmful to public health and the environment. These six pollutants are particulate matter (PM), ground-level ozone (O₃), carbon monoxide (CO), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), and lead (Pb). EPA calls these pollutants "criteria" air pollutants because it regulates them by developing human health-based and/or environmentally-based criteria (science-based guidelines) for setting permissible levels.

Under amendments to the Clean Air Act, EPA has classified air basins or portions thereof, as either "attainment" or "nonattainment" for each criteria pollutant, based on whether or not the national standards have been achieved. The California Clean Air Act, patterned after the federal Clean Air Act, also designates areas as "attainment" or "nonattainment" for State standards. Thus, California has two sets of attainment/nonattainment designations: one with respect to national standards and one with respect to State standards.

Table 2.2-1 identifies the ambient air quality standards and attainment status for criteria pollutants. The Bay Area has nonattainment status for ozone (State and Federal standards) and particulate matter—PM₁₀ and PM_{2.5} (State standards; expected to be designated as non-attainment for PM_{2.5} under the new federal standard December 18, 2008; see Table 2.2-1 footnote c). The Bay Area does attain the state and federal CO standards; however, CO is a concern because it is the predominant pollutant from passenger vehicles. Based on attainment status, this

EIR focuses its analysis on ground-level ozone, carbon monoxide¹ and particulate matter. Table 2.2-2 presents a ten-year Bay Area air quality summary for days over the national and California standards for ozone, carbon monoxide, and particulate matter. Each of these criteria pollutants is discussed in more detail in the following pages.

Table 2.2-1: Bay Area Ambient Air Quality Standards and Attainment Status

Pollutant	Averaging Time	California Standard	Attainment Status for California Standard	Federal Primary Standard	Attainment Status for Federal Standard	Major Pollutant Sources
Ozone	8 hour	0.070 ppm ^a	Non-Attainment	0.075 ppm	Non-Attainment	Motor vehicles,
	1 hour ^b	0.09 ppm	Non-Attainment	---	---	Other mobile sources, combustion, industrial and commercial processes
Carbon Monoxide	8 hour	9.0 ppm	Attainment	9 ppm	Attainment	Internal combustion engines, primarily gasoline-powered motor vehicles
	1 Hour	20 ppm	Attainment	35 ppm	Attainment	
Particulate Matter (PM ₁₀)	Annual Arithmetic Mean	20 µg/m ³	Non-Attainment	---	---	Dust- and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays)
	24 hour	50 µg/m ³	Non-Attainment	150 µg/m ³	Unclassified	
Particulate Matter (PM _{2.5})	Annual Arithmetic Mean	12 µg/m ³	Non-Attainment	15 µg/m ³	Attainment	Same as above
	24 hour	---	---	35 µg/m ^{3c}	Unclassified	

^aPPM=parts per million; mg/m³=milligrams per cubic meter; and µg/m³=micrograms per cubic meter

^bNational 1-hour standard revoked by U.S. EPA on 6/15/05; it was replaced with a more stringent 8- hour standard.

^cU.S. EPA lowered the 24-hour PM_{2.5} standard from 65µg/m³ to 35µg/m³ in 2006. EPA is expected to designate the Bay Area in non-attainment when attainment statuses are finalized on December 18, 2008.

Source: Bay Area Air Quality Management District, 2008; California Air Resource Board, 2008

¹ In April 1998, the Bay Area was re-designated to attainment for the national 8-hour carbon monoxide standard. However, the Bay Area must continue to demonstrate attainment of that standard. Because of this reason, this EIR evaluates the carbon monoxide impacts of the Transportation 2035 Plan.

Table 2.2-2: Ten-Year Bay Area Air Quality Summary (1998 to 2006)

<i>Days Over Standard for Ozone, Carbon Monoxide and Particulate Matter (PM)</i>										
Year	Ozone				Carbon Monoxide			PM ₁₀		PM _{2.5}
	1-Hr		8-Hr		1-Hr		8-Hr	24-Hr		24-Hr ¹
	Nat	Cal	Nat	Cal	Nat	Cal	Nat/Cal	Nat	Cal	Nat
1998	8	29	16	-	0	0	0	0	5	-
1999	3	20	9	-	0	0	0	0	12	-
2000	3	12	4	-	0	0	0	0	7	1
2001	1	15	7	-	0	0	0	0	10	5
2002	2	16	7	-	0	0	0	0	6	7
2003	1	19	7	-	0	0	0	0	6	0
2004	0	7	0	-	0	0	0	0	7	1
2005	-	9	1	9	0	0	0	0	6	0
2006	-	18	12	22	0	0	0	0	15	10
2007	-	4	1	9	0	0	0	0	4	14

¹2000 is the first full year of which the BAAQMD measured PM_{2.5} levels, 2006 and 2007 exceedances reflect the revised, more stringent, standard EPA implemented on December 17th 2006.

Nat = National, Cal =California

Source: Bay Area Air Quality Management District, 2008

Ozone

Ozone (O₃) is a reactive pollutant, which is not emitted directly into the atmosphere, but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) and oxides of nitrogen (NO_x). ROG and NO_x are known as precursor compounds of ozone. Motor vehicle exhaust and industrial emissions, gasoline vapors, and chemical solvents are some of the major sources of ROG and NO_x that help to form ozone. Ozone is a regional air pollutant because it is formed downwind of sources of ROG and NO_x under the influence of wind and sunlight. During summertime (particularly on hot, sunny days with little or no wind), ozone levels are at their highest levels.

Short-term exposure to elevated concentrations of ozone is linked to such health effects as eye irritation and breathing difficulties. Repeated exposure to ozone can make people more susceptible to respiratory infections and aggravate pre-existing respiratory diseases. Long-term exposures to ozone can cause more serious respiratory illnesses. Ozone also damages trees and other natural vegetation, reduces agricultural productivity, and causes deterioration of building materials, surface coatings, rubber, plastic products and textiles.

Tables 2.2-3 and 2.2-4 show exceedances of the State 1-hour ozone standard and national 8-hour ozone standard, respectively. The number of days the region experiences unhealthy ozone levels has fallen overall. This improvement is due to ARB regulations affecting motor vehicle emissions and Bay Area Air Quality Management District (BAAQMD) regulations to reduce emissions from industrial and commercial sources.

Table 2.2-3: Days Exceeding the State 1-Hour Ozone Standard (1986-2007)

Stations by Sub-Region	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07
North Counties																						
Napa	0	6	1	2	0	3	0	2	0	4	0	0	3	4	0	1	1	2	0	0	1	0
San Rafael	0	1	1	0	0	0	0	0	0	0	2	1	0	2	0	0	0	0	0	0	0	0
Santa Rosa	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0
Sonoma	1	2	2	3	0	3	0	0	0	0	0											
Vallejo	0	6	5	2	2	2	1	3	2	6	5	1	3	4	0	0	1	2	1	0	0	0
Coast and Central Bay																						
Oakland*****	0	1	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0		
Richmond	0	0	2	1	0	0	0	2	0	0	0											
San Francisco	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
San Pablo												1	0	1	0	0	0	0	1	0	0	0
Eastern District																						
Benicia*****																						0
Bethel Island	8	14	7	11	5	3	7	3	5	6	6	1	10	5	1	3	5	0	1	0	9	0
Concord	5	20	10	6	3	4	3	7	4	9	11	2	13	8	2	6	5	5	1	1	8	1
Fairfield	0	9	3	4	1	3	3	3	2	10	5	0	9	9	1	3	4	0	1	0	3	0
Livermore	20	10	21	9	8	17	14	7	5	20	22	3	21	14	7	9	10	10	5	6	13	2
Pittsburg	1	14	8	5	4	0	3	4	3	8	5	0	4	2	1	2	4	0	0	0	3	1
South Central Bay																						
Fremont	3	17	7	11	3	6	5	5	4	10	2	2	7	3	2	3	3	4	0	1	4	0
Hayward**	1	12	9	1	0	2	1	0	1	7	2	2	4	4	1	2	0	3	0		2	0
Mountain View***	1	16	13	6	1	3	1	2	0	2	3	1	2	7								
Redwood City	1	2	2	1	0	0	0	1	0	5	1	0	0	0	0	1	0	1	1	0	0	0
San Leandro	0	0	0	0	0	2	2	3	0	6	2	3	2	3	1	0	1	2	1	1	0	0
Santa Clara Valley																						
Gilroy*	5	19	23	10	5	5	12	6	3	10	15	1	10	3		3	6	6	0	0	4	0
Los Gatos	21	25	12	1	5	7	3	8	2	13	10	1	5	4	0	2	4	7	0	3	7	0
San Jose****	12	23	12	10	4	6	3	3	2	14	5	0	4	3	0	2		4	0	1	5	0
San Jose East	5	22	13	9	1		5	5	3	15	5	1	5	2	1	0	0	2	0	1		
San Jose-Burbank					5	0	1	4	1													
San Martin									5	14	18	0	15	7	4	7	8	9	0	2	7	1
Sunnyvale															0	0	0	4	1	1	3	0
District Days	39	45	41	22	14	23	23	19	13	28	34	8	29	20	12	15	16	19	7	9	18	4

*Gilroy closed from 11/1/99 to 3/31/01 **Hayward Closed from 4/96 to 8/23/96 ***Mountain View closed 12/3/99

****San Jose 4th St closed 4/30/02; reopened as San Jose Central 10/5/02*****Oakland and San Jose East stations were closed on 11/30/05; *****Benicia site began operation on 4/1/2007

Source: Bay Area Air Quality Management District, 2008

Table 2.2-4: Days Exceeding the National 8-Hour Ozone Standard (1998-2007)

Site	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
North Counties										
Napa	1	1	0	0	0	0	0	0	0	0
San Rafael	0	0	0	0	0	0	0	0	0	0
Santa Rosa	0	0	0	0	0	0	0	0	0	0
Vallejo	0	1	0	0	0	0	0	0	0	0
Coast & Central Bay										
Oakland***	0	0	0	0	0	0	0	0		
San Francisco	0	0	0	0	0	0	0	0	0	0
San Pablo	0	0	0	0	0	0	0	0	0	0
Eastern District										
Benicia***										0
Bethel Island	5	5	1	2	3	0	0	0	1	0
Concord	6	6	1	1	3	1	0	0	4	0
Fairfield	3	4	0	0	0	0	0	0	1	0
Livermore	10	5	2	2	6	3	0	1	5	1
Pittsburg	1	1	0	1	2	0	0	0	1	0
South Central Bay										
Fremont	0	1	0	0	0	1	0	0	0	0
Hayward	0	1	0	1	0	1	0		0	0
Redwood City	0	0	0	0	0	0	0	0	0	0
San Leandro	0	0	0	0	0	0	0	0	0	0
Santa Clara Valley										
Gilroy	4	0		2	2	2	0	0	2	0
Los Gatos	2	1	0	1	2	2	0	1	4	0
Mountain View/Sunnyvale**	0	1		0	0	2	0	0	0	0
San Jose, 4th Street/Central*	1	0	0	0		0	0	0	1	0
San Jose East***	0	0	0	0	0	0	0	0		
San Martin	6	3	1	2	5	4	0	0	5	0

* San Jose 4th Street station was closed for relocation on April 30, 2002 and reopened as San Jose Central on October 5, 2002. Ozone statistics for 2002 have been omitted.

** Mountain View site was closed at the end of 1999. Sunnyvale site began operation in April 2001.

***Oakland and San Jose East stations were closed on 11/30/05; ***Benicia site began operation on 4/1/2007

Source: Bay Area Air Quality Management District, 2008

Carbon Monoxide

Carbon monoxide (CO) is an odorless and invisible gas. It is a non-reactive pollutant that is a product of incomplete combustion of gasoline in automobile engines. Carbon monoxide is a localized pollutant, and the highest concentrations are found near the source. Ambient carbon monoxide concentrations generally follow the spatial and temporal distributions of vehicular traffic and are influenced by wind speed and atmospheric mixing. Carbon monoxide concentrations are highest in flat areas on still winter nights, when temperature inversions trap the carbon monoxide near the ground. When inhaled at high concentrations, carbon monoxide reduces the oxygen-carrying capacity of the blood, which, in turn, results in reduced oxygen reaching parts of the body. Most of the Bay Area's carbon monoxide comes from on-road motor vehicles, although a substantial amount also comes from burning wood in fireplaces. Over the past 10 years, the Bay Area has not experienced any exceedances of either the national or state carbon monoxide standard.

Particulate Matter

Particulate matter includes dirt, dust, soot, smoke and liquid droplets found in the air. Coarse particulate matter, or PM_{10} , refers to particles less than or equal to 10 microns in diameter (about one-seventh the diameter of a human hair). PM_{10} is primarily composed of large particles from sources such as road dust, residential wood burning, construction/demolition activities, and emissions from on- and off-road engines. Some sources of particulate matter, such as demolition and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect. Fine particulate matter, or $PM_{2.5}$, refers to particles less than or equal to 2.5 microns in diameter, and contains particles formed in the air from primary gaseous emissions. Examples include sulfates formed from SO_2 emissions from power plants and industrial facilities, nitrates formed from NO_x emissions from power plants, automobiles, and other combustion sources, and carbon formed from organic gas emissions from automobiles and industrial facilities.

The Bay Area experiences its highest particulate matter concentrations in the winter, especially during evening and night hours, due to the cool temperatures, low-wind speeds, low inversion layers, and high humidity. Specifically, $PM_{2.5}$ is viewed as a significant component of the region's total particulate matter problem because the $PM_{2.5}$ fraction of total particulate matter accounts for approximately 60 percent of the PM_{10} during the winter and approximately 45 percent during the rest of the year. On days when the PM standards are exceeded, $PM_{2.5}$ can account for as much as 90 percent of PM_{10} .

Coarse and fine particulate matters are small enough to get into the lungs and can cause numerous health problems, including respiratory conditions such as asthma and bronchitis, and heart and lung disease. People with heart or lung disease, the elderly, and children are at highest risk from exposure to particulate matter.

Toxic Air Contaminants

The California Health and Safety Code defines toxic air contaminants (TACs) as air pollutants that may cause or contribute to an increase in mortality or in serious illness, or that may pose a present or potential hazard to human health. TACs are less pervasive in the urban atmosphere than criteria air pollutants, but are linked to short-term (acute) or long-term (chronic and/or carcinogenic) adverse human health effects. The carcinogenic potential of TACs is a particular

health concern because many scientists currently believe that there is “no safe” level of exposure to carcinogens.²

There are many different types of TACs with varying degrees of toxicity. TACs may also exist as particulate matter or as vapors or gases. Sources of TACs include industrial processes, commercial operations (e.g., gasoline stations and dry cleaners), and motor vehicle exhaust—particularly diesel-powered vehicles. Compared to other air toxics that ARB has identified and controlled, diesel particulate matter (DPM) emissions are estimated to be responsible for about 70 percent of the total ambient air toxics risk.

The top three contributors of the potential cancer risk come primarily from motor vehicles—diesel particulate matter overall, and 1,3-butadiene and benzene as specific components of DPM. Cleaner motor vehicles and fuels are reducing the risks from the three priority toxic air pollutants. The remaining toxic air pollutants, such as hexavalent chromium and perchloroethylene, while not appearing to contribute as much to the overall risks, can present high risks to people living close to a source because the highest concentrations of TACs are found near the source. ARB has control measures either already on the books, in development, or under evaluation for most of the remaining top ten, where actions are suitable through motor vehicles, consumer products, or industrial source programs.

Health risks from diesel PM are highest in areas of concentrated emissions, such as near ports, rail yards, freeways, or warehouse distribution centers. According to the ARB, diesel engine emissions are responsible for the majority of California’s known cancer risk from outdoor air pollutants. Those most vulnerable are children whose lungs are still developing and the elderly who may have other serious health problems. ARB has also stated that PM is a contributing factor for premature death from heart and/or lung diseases according to numerous studies. In addition, diesel PM causes visibility reduction and is a potent greenhouse agent involved in global warming.³

According to the ARB, the levels of toxic air pollutants have decreased significantly with the adoption of airborne toxic control measures, stringent vehicle standards, the requirements for low emission vehicles, and cleaner fuels. Since 1990, there has been a statewide reduction of 75 percent in lead, 65 percent in benzene, 60 percent in hexavalent chromium, 45 percent in 1, 3-butadiene, and 40 percent in diesel particulate matter overall. The estimated cancer risk from TACs, measured statewide, has been reduced by 45 percent since 1990.

In the Bay Area, the Port of Oakland is a high volume cargo facility, making it the fourth busiest container port in the U.S. Heavy-duty trucks, cargo handling equipment and ships operate within and to/from the Port, producing DPM emissions at the Port and surrounding neighborhoods. A number of health risk assessments, mitigation programs, and emissions plans have recently been developed or are underway to identify, analyze, and mitigate the health and environmental

² Southern California Association of Governments, Draft 2008 RTP EIR (January 2008)

³ See ARB’s fact sheet entitled “Health Effects of Diesel Exhaust Particulate Matter found at http://www.arb.ca.gov/research/diesel/dpm_draft_3-01-06.pdf

impacts associated with port-related activities.⁴ For instance, the ARB has recently completed a Health Risk Assessment (HRA) for West Oakland, including the Port of Oakland. The HRA predicts health impacts of exposure for populations living around the Port of Oakland, the Union Pacific Oakland Rail Yard and surrounding freeways. While this EIR will evaluate diesel PM from heavy-duty trucks, 1,3-butadiene, and benzene, it does not calculate other port-related emissions associated with ships, port cargo handling equipment, or railroads serving the port because decisions about these aspects of port operations are made separately from the Transportation 2035 Plan. However, when project sponsors prepare project-level environmental assessments, detailed analysis of exposure of sensitive receptors to substantial concentrations of TACs should be performed and appropriate mitigations should be identified for significant impacts pursuant to CEQA/NEPA.

REGULATORY SETTING

Air District Boundaries

The nine-county MTC region encompasses the San Francisco Bay Air Basin in its entirety and portions of both the North Coast Air Basin and the Sacramento Valley Air Basin. Northern Sonoma County is within the North Coast Air Basin, while eastern Solano County is within the Sacramento Valley Air Basin. (Both southern Sonoma County and western Solano County are within the San Francisco Bay Air Basin.) The BAAQMD governs the San Francisco Bay Air Basin, while the Northern Sonoma County Air Pollution Control District (NSCAPCD) governs the North Coast Air Basin and the Yolo-Solano Air Pollution Control District (YSAPCD) governs the Sacramento Valley Air Basin portion that corresponds to MTC's jurisdiction. The geographic boundaries of these air basins and air districts are shown in Figure 2.2-3. In California, air pollution control districts generally follow county boundaries. In the more urban areas, county agencies were merged by state legislation into unified air quality management districts.

⁴ Recent efforts to evaluate port-related emissions and health risks include ARB's Health Risk Assessment (HRA) for West Oakland (<http://www.arb.ca.gov/ch/communities/ra/westoakland/westoakland.htm>); BAAQMD's Green Ports Initiative (<http://www.baaqmd.gov/CARE/index.htm>), and Port of Oakland/BAAQMD's Maritime Air Quality Improvement Plan (http://www.portofoakland.com/enviro/m/prog_04c.asp).

Figure 2.2-1

Bay Area Air Quality Management District Boundaries



Federal Regulations

Federal Clean Air Act

The federal Clean Air Act (CAA) of 1970, amended in 1977 and 1990 (42 USC 7506(c)), was enacted for the purposes of protecting and enhancing the nation's air resources to benefit public health. In 1971, to achieve the purposes of Section 109 of the act, the U.S. Environmental Protection Agency (EPA) promulgated National Ambient Air Quality Standards (NAAQS). The NAAQS require that certain pollutants should not exceed specified levels; areas that exceed the standard for specified pollutants are designated as "non attainment" areas. Six pollutants of primary concern were designated: ozone (O₃), carbon monoxide (CO), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), lead (Pb), and suspended particulate matter (PM₁₀ and PM_{2.5}). In promulgating the NAAQS, the EPA allowed some states the option to develop stricter state standards. As such, California has adopted its own set of stricter standards under the California Clean Air Act (CCAA) of 1988 (described under State Regulations).

The federal CAA requires states to develop State Implementation Plans (SIPs) that outline how each state will control air pollution under the CAA. A SIP is a collection of the regulations, programs and policies that a state will use to clean up polluted areas. The states must involve the public and industries through hearings and opportunities to comment on the development of each state plan. The Bay Area's latest SIP is the *2001 Ozone Attainment Plan*, which demonstrates how the region is addressing the national 1-hour ozone standard.

1990 Amendments to Clean Air Act

The 1990 Amendments to the CAA included a provision to address air toxics. Under Title III of the CAA, EPA establishes and enforces National Emission Standards for Hazardous Air Pollutants (NESHAPs), which are nationally uniform standards oriented towards controlling particular hazardous air pollutants (HAPs). Section 112(b) of the CAA identifies 189 Air Toxics (hazardous air pollutants), directs EPA to identify sources of the 189 pollutants, and establishes a ten-year time period for EPA to issue technology-based emissions standards for each source category. Title III provides for a second phase under which EPA is to assess residual risk after the implementation of the first phase of standards and impose new standards, when appropriate, to protect public health.

Federal Transportation Conformity Requirements

The 1990 CAA outlines requirements for ensuring that federal transportation plans, programs and projects "conform" to the State Implementation Plan's (SIP) purpose of eliminating or reducing the severity and number of violations of the national ambient air quality standards. The EPA subsequently published regulations to implement the 1990 CAA conformity requirements in November 1993, and has revised them multiple times, with January 2008 the most recent revision that reflects the SAFETEA final rulemaking. Metropolitan Planning Organizations (MPOs) such as MTC are required to adopt and follow these regulations. MTC Resolution No. 3757 is the MTC resolution adopting EPA's most current regulation on conformity procedures for plans, programs and projects. These same conformity requirements have also been adopted by ABAG

and the BAAQMD. These regulations and resolutions state, in part, that MTC cannot approve any transportation plan, program or project unless these activities conform to the purpose of the SIP.⁵

The federal conformity analysis and findings are addressed in a separate process from the EIR and, under EPA regulations, include extensive requirements for consultation with transportation and air quality agencies and the public. For this reason, this EIR does not include a significance criterion or detailed impact analysis related to consistency with applicable air quality plans. However, MTC's Draft Transportation Air Quality Conformity Analysis for the Transportation 2035 Plan and 2009 Transportation Improvement Program Amendment #09-06 shows that estimated total motor vehicle emissions are lower than the allowed amount for criteria pollutants NO_x, ROG, and CO in the SIP and that adopted Transportation Control Measures in the SIP are being implemented in a timely manner. This draft conformity analysis is incorporated here by reference. The final results of the federal conformity analysis will be included by reference in the final Transportation 2035 Plan.⁶

State Regulations

Toxic Air Contaminant Identification and Control Act of 1983

In Assembly Bill (AB) 1807 (Chapter 1047, Statutes of 1983), the California Legislature established a two-step process of risk identification and risk management to address the potential health effects from air toxic substances and protect the public health of Californians. During the first step (identification), the ARB and the Office of Environmental Health Hazard Assessment (OEHHA) determines if a substance should be formally identified as a toxic air contaminant (TAC) in California. In the second step (risk management), the ARB reviews the emission sources of an identified TAC to determine if any regulatory action is necessary to reduce the risk. The analysis includes a review of controls already in place, the available technologies and associated costs for reducing emissions, and the associated risk. Public outreach is an essential element in the development of a control plan and any control measure to ensure that the ARB efforts are cost-effective and appropriately balance public health protection and economic growth.

In 1993, the California Legislature amended the AB 1807 program for the identification and control of TACs (AB 2728). Specifically, AB 2728 required the ARB to identify the 189 federal hazardous air pollutants as TACs. For those substances that have not previously been identified under AB 1807 and identified under AB 2728, health effects values will need to be developed. This report will serve as a basis for that evaluation. For substances that were not identified as

⁵ "Transportation plan" refers to the Regional Transportation Plan (RTP). "Program" refers to the Transportation Improvement Program (TIP), which is a financially realistic set of highway and transit projects to be funded over the next four fiscal years. A "transportation project" is any highway or transit improvement, which is included in the RTP and TIP and requires funding or approval from the Federal Highway Administration or the Federal Transit Administration.

⁶ See MTC's Draft Transportation Air Quality Conformity Analysis for the Transportation 2035 Plan and 2009 Transportation Improvement Program Amendment #09-06 (January 2009) for more information. See also MTC's web page, <http://www.mtc.ca.gov>, for more information about the Air Quality Conformity Task Force meetings and materials related to the federal conformity analysis.

TACs and are on the TAC Identification List, this report will provide information to evaluate which substances may be entered into the air toxics identification process.

Assembly Bill 2588 Air Toxics "Hot Spots" Information and Assessment Act of 1987

In September 1987, the California Legislature established the Assembly Bill (AB) 2588 Air Toxics "Hot Spots" Information and Assessment Act of 1987 (Health and Safety Code Sections 44300-44394). It requires facilities to report their air toxics emissions, ascertain health risks, and to notify nearby residents of significant risks. The emissions inventory and risk assessment information from this program has been incorporated into this report. In September 1992, the "Hot Spots" Act was amended by Senate Bill 1731 which required facilities that pose a significant health risk to the community to reduce their risk through a risk management plan.

California Clean Air Act

The California Clean Air Act (CCAA) of 1988 requires nonattainment areas to achieve and maintain the state ambient air quality standards by the earliest practicable date and local air districts to develop plans for attaining the state ozone, carbon monoxide, sulfur dioxide, and nitrogen dioxide standards. The California Air Resources Board (ARB) sets the state ambient air quality standards.

Under the CCAA, areas not complying with the standard must prepare plans to reduce ozone. Non-compliance with the state ozone standard does not impact the ability to proceed with any transportation plan, program, or project. At this time, no major metropolitan area in the state complies with the state ozone standard. The first Bay Area Clean Air Plan (CAP) was adopted in 1991, and updates to the CAP have occurred since then, with the most recent being the *Bay Area 2005 Ozone Strategy Plan*. The CAP is currently being updated by the BAAQMD to ensure it contains "all feasible measures" (a draft Bay Area 2009 CAP will be available in spring 2009).

Senate Bill 656 (Chapter 738, Statutes of 2003)

In 2003, the Legislature enacted Senate Bill (SB) 656 (Chapter 738, Statutes of 2003), codified as Health and Safety Code Section 39614, to reduce public exposure to PM₁₀ and PM_{2.5}. SB 656 requires ARB, in consultation with local air pollution control and air quality management districts (air districts), to develop and adopt, by January 1, 2005, a list of the most readily available, feasible, and cost-effective control measures that could be employed by ARB and the air districts to reduce PM₁₀ and PM_{2.5} (collectively referred to as PM). The legislation establishes a process for achieving near-term reductions in PM throughout California ahead of federally required deadlines for PM_{2.5}, and provides new direction on PM reductions in those areas not subject to federal requirements for PM. Measures adopted as part of SB 656 will complement and support those required for federal PM_{2.5} attainment plans, as well as for State ozone plans. This will ensure continuing focus on PM reduction and progress towards attaining California's more health protective standards. This list of air district control measures was adopted by the ARB on November 18, 2004. ARB also developed a list of State PM control measures for mobile and stationary sources, including measures planned for adoption as part of ARB's Diesel Risk Reduction Plan. The lists are at the following web site: <http://www.arb.ca.gov/pm/pmmeasures/pmmeasures.htm>. To comply with SB 656, the BAAQMD reviewed the list of 103 potential PM control measures prepared by ARB and developed a Particulate Matter Implementation Schedule which was adopted by the BAAQMD in November 2005.

California Health and Safety Code, Division 26 (Air Resources)

Under the California Health and Safety Code, Division 26 (Air Resources), the ARB is authorized to adopt regulations to protect public health and the environment through the reduction of TACs and other air pollutants with adverse health effects. As such, the ARB has promulgated several mobile and stationary source airborne toxic control measures (ATCMs). For instance, effective as of July 2003, ARB approved an ATCM that limits school bus idling and idling at or near schools to only when necessary for safety or operational concerns (13 CCR Chapter 10 Section 2480). This ATCM is intended to reduce DPM and other TACs and air pollutants from heavy-duty motor vehicle exhaust. It applies to school buses, transit buses, school activity buses (SPABs), youth buses, general public paratransit vehicles, and other commercial motor vehicles. This ATCM focuses on reducing public exposure to DPM and other TACs, particularly for children riding in and playing near school buses and other commercial motor vehicles, who are disproportionately exposed to pollutants from these sources. In addition, effective February 2005, the ARB approved an ATCM to limit the idling of diesel-fueled commercial motor vehicles with gross vehicular weight ratings of greater than 10,000 pounds, regardless of the state or country in which the vehicle is registered (13 CCR Chapter 10 Section 2485).

IMPACT ANALYSIS

SIGNIFICANCE CRITERIA

Implementation of the Transportation 2035 Plan would have a potentially significant adverse impact if Plan projects would result in:

- Criterion 1:** An increase in short-term construction-related emissions
- Criterion 2:** A cumulatively considerable net increase of emissions of criteria pollutants ROG, NO_x, CO, PM₁₀, and PM_{2.5} from on-road mobile sources compared to existing conditions.
- Criterion 3:** A cumulatively considerable net increase in emissions of diesel particulate matter, 1, 3-butadiene, and benzene (toxic air contaminants) from on-road mobile sources compared to existing conditions.

As a reminder, this EIR does not include a significance criterion or detailed impact analysis related to consistency with applicable air quality plans because the required federal conformity analysis and findings are addressed in a separate process from the EIR.

METHOD OF ANALYSIS

Construction-Related Emissions

Construction emissions can vary depending on the level of activity, the specific operations taking place, the equipment being operated, local soil conditions, weather conditions, and other factors. According to the BAAQMD, despite this variability in emissions, experience has shown that there are a number of feasible control measures that can be reasonably implemented to significantly

reduce emissions from construction (particularly PM₁₀). The BAAQMD's approach to environmental assessment of construction impacts is to emphasize implementation of effective and comprehensive control measures rather than detailed quantification of emissions.⁷ MTC is following this guidance by conducting a qualitative assessment of construction-related emission impacts and identifying a wide range of mitigations to address these emissions.

In addition, MTC contacted the Sacramento Metropolitan Air Quality Management District (SMAQMD) to inquire if its Road Construction Emissions Model would be appropriate for use in modeling construction-related emissions due to the implementation of the proposed Transportation 2035 Plan. The Road Construction Emissions Model is a simple model used to estimate project-level construction emissions for linear type projects (roadways, pipelines, levee work, etc.). According to the SMAQMD, since the proposed Transportation 2035 Plan is a program-level document, it may be hard to estimate project level construction details necessary to input into the model and get meaningful results. In the Sacramento region, The Sacramento Area Council of Governments (SACOG) did not use the Road Construction Emissions Model for its analysis of construction emissions. MTC concurs with this approach, so as stated above, this EIR describes construction impacts qualitatively, and, like SACOG, assumes that construction emissions will be analyzed during the environmental review conducted at the project level, and once significance is determined, mitigation measures will be included as necessary.

Motor Vehicle Emissions

MTC's travel demand forecasting models produce forecasts of travel behavior and vehicle activity. These models have been extensively reviewed by federal and state agencies and refined in connection with their application to air quality analyses of various kinds. Key model outputs for use in air quality analyses include: total daily vehicle trips, vehicle miles of travel (VMT), and distribution of vehicle miles of travel by speed. This information is then used to determine total emissions from transportation activity in the Bay Area using motor vehicle emissions models developed and maintained by the ARB.

ARB's latest emissions inventory model that calculates emissions for motor vehicles operating on roads in California is EMFAC2007. EMFAC2007 generates emission factors for all types of on-road vehicles under different ambient and driving conditions. ARB develops these factors based on thousands of emissions tests on both new and used vehicles recruited randomly from the California fleet. In the EMFAC2007 model, the emission rates are combined with vehicle activity data provided by regional transportation agencies (such as MTC) to calculate the regional emissions inventories.

Emission estimates for ROG, NO_x, CO and particulate matter (associated with engine exhaust and tire wear) are direct outputs from EMFAC2007. To obtain rough estimates of the amount of particulate matter generated by autos from roads (called "entrained dust"), regional VMT⁸ are

⁷ Bay Area Air Quality Management District, *BAAQMD CEQA Guidelines: Assessing the Air Quality Impacts of Projects and Plans*, December 1999.

⁸ Note that MTC upwardly adjusts the regional VMT forecasts from the MTC travel demand models to account for differences in VMT estimates produced by ARB and MTC using a protocol prescribed by ARB.

multiplied by the following (annual) factors: (1) 0.400 grams/mile entrained dust for PM₁₀, and (2) 0.060 grams/mile entrained dust for PM_{2.5}.

Toxic Air Contaminants

The new California-specific transportation air quality analysis tool, CT-EMFAC,⁹ is designed to model mobile source air toxics (MSATs, also referred to as toxic air contaminants). Specifically, MTC uses the CT-EMFAC model to estimate diesel particulate matter, benzene, and 1, 3-butadiene emissions. Similar to EMFAC2007, CT-EMFAC calculates MSATs based on user-specified VMT and speed.

Comparison with the No Project

As stated above, for purposes of determining the significance of impacts, this impact analysis compares the proposed Project in year 2035 to the existing conditions in year 2006. However, the impact analysis also includes a comparison of the 2035 Project to the 2035 No Project alternative. The 2035 No Project alternative and 2035 Project comparison helps differentiate the impacts of implementing the proposed Transportation 2035 from the cumulative population and employment growth impacts that increase demand on the regional transportation system and associated motor vehicle emissions and which are largely independent from the proposed Transportation 2035 Plan policies and investments. The No Project alternative is equivalent to what would occur in the future if the proposed Project were not implemented. For more information on the No Project alternative, please see *Chapter 3.1: Alternatives to the Project*.

⁹ CT-EMFAC Ver. 2.0, February 1, 2008, Prepared for California Department of Transportation Division of Transportation Planning, UC Davis-Caltrans Air Quality Project, Task Orders No. 61 and 67

FUTURE TRANSPORTATION CONDITIONS (2035)

Table 2.2-5 provides the core 2035 travel activity data used to calculate regional motor vehicle emissions. Between 2006 and 2035, the Bay Area is projected to add about 1.9 million people (26 percent increase) and 1.7 million jobs (50 percent increase). Based on expected future growth, MTC estimates that the total vehicle miles traveled will increase by 32 percent, which means that VMT is growing slightly higher relative to population growth but considerably lower compared to robust job growth in the region. Note that changes in average regional vehicle speeds also affect emissions.

Table 2.2-5: Travel Data

	2006	2035		Change 2006 to 2035 Project		Change 2035 No Project v 2035 Project	
		No Project	Project	Numerical	Percent	Numerical	Percent
Vehicles in Use	4,847,000	6,729,000	6,694,000	1,846,000	38%	-35,000	-0.5%
Daily Vehicle Miles Traveled (VMT)	159,232,000	210,879,000	209,784,000	50,552,000	32%	-1,095,000	-0.5%
Engine Starts	32,413,000	44,144,000	43,912,000	11,499,000	35%	-233,000	-0.5%
Total Population	7,159,000	9,031,000					
Total Employment	3,499,000	5,248,000					

Source: Metropolitan Transportation Commission, 2008

SUMMARY OF IMPACTS

The proposed Project would result in short-term construction impacts as transportation projects in the Plan advance into construction, at different times, over the next 25 years. Compared to existing conditions, the cumulative impacts in 2035 with the proposed Project show significantly lower ROG, NO_x, and CO emissions largely because of stringent emission controls for new vehicles engines and fuels. Similarly, cumulative impacts in 2035 with the proposed Project show significantly lower TACs (diesel particulate matter, 1, 3-butadiene and benzene) due to California's toxics control programs. However, due to growth in vehicle miles traveled and generation of road dust, cumulative emissions of PM₁₀ and PM_{2.5} are expected to increase under the proposed Project compared to existing conditions, but PM emissions will still be lower than the No Project alternative.

IMPACTS AND MITIGATION MEASURES

Impact

2.2-1 Construction-related emissions of criteria pollutants could increase due to the construction of projects in the proposed Project. (*Significant, Unavoidable*)

Construction-related emissions are generally temporary in duration (depending on the scope of the project) but can impact air quality. Construction-related emissions for projects included in the proposed Transportation 2035 Plan may come from (1) grading, excavation, road building, and other earthmoving activities; (2) travel by construction equipment, especially on unpaved surfaces; and (3) exhaust from construction equipment. The air quality impacts would occur in localized areas depending on the site conditions. Although these activities and emissions would last only a short time, they may be troublesome to persons in the adjacent areas.

The overall impact of the proposed Transportation 2035 Plan due to construction of transportation projects would result in a direct but short-term impact as projects advance into construction, at different times, over the 25-year horizon of the Transportation 2035 Plan. In some instances, there may be capital projects with longer construction periods that would produce construction emissions that may be longer-term. For purposes of this program-level CEQA analysis, construction-related emissions are identified as a potentially significant impact. As project-level environmental documents are prepared by project sponsors for CEQA/NEPA purposes, project-level analysis would estimate construction emissions for each project based on detailed plans, and would establish mitigation measures to reduce air quality impacts.

Mitigation Measures

As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce construction-related air quality impacts that shall be considered by project sponsors and decision-makers may include, but are not limited to, those described below.

2.2(a) Typical mitigation measures that can be considered by project sponsors include¹⁰:

- Water or dust suppressants shall be applied to exposed earth surfaces at all transportation construction projects to control emissions at least twice daily;
- All trucks hauling dirt, sand, soil, or other loose materials off-site shall be covered or wetted or shall maintain at least two feet of freeboard (i.e. minimum vertical distance between the top of the load and the top of the trailer);
- All excavating and grading activities shall cease during periods of high winds;
- All construction roads that have high traffic volumes, shall be surfaced with base material or decomposed granite, or shall be paved or otherwise be stabilized;
- Public streets shall be cleaned, swept or scraped at frequent intervals or at least three times a week or once a day if visible soil material has been carried onto adjacent public roads (no mechanical “dry” sweeping shall be allowed);
- Construction equipment shall be visually inspected prior to leaving the site and loose direct dirt shall be washed off with wheel washers as necessary;
- Paving or water or non-toxic soil stabilizers shall be applied as needed to reduce off-site transport of fugitive dust from all unpaved access roads, parking and staging areas and other unpaved surfaces;
- Traffic speeds on all unpaved surfaces shall not exceed 15 mph;

¹⁰ Adapted from BAAQMD, CEQA Guidelines (1999) and SCAG, Draft 2008 RTP PEIR (January 2008)

- Low sulfur or other alternative fuels shall be used in construction equipment where feasible;
- Idling time of construction vehicles and equipment shall not exceed five (5) minutes;
- Construction vehicles shall be properly maintained and tuned;
- Deliveries related to construction activities that affect traffic flow shall be scheduled during off-peak hours (e.g., 10:00 A.M. and 3:00 P.M.) and coordinated to achieve consolidated truck trips. When the movement of construction materials and/or equipment impacts traffic flow, temporary traffic control shall be provided to improve traffic flow (e.g., flag person);
- To the extent possible, construction activity shall utilize electricity from power poles rather than temporary diesel power generators and/or gasoline power generators;
- Hydroseed or apply non-toxic soil stabilizers to inactive construction areas;
- Install sandbags or other erosion control measures to prevent silt run-off to public roadways;
- Install wind breaks, or plant trees/vegetative wind breaks at windward side(s) of construction areas;
- Maintain on-site truck loading zones;
- Configure on-site construction parking to minimize traffic interference and to ensure emergency vehicle access;
- Provide temporary traffic control during all phases of construction activities to improve traffic flow;
- During construction, replace ground cover in disturbed areas as quickly as possible;
- During the period of construction, install wheel washers where vehicles enter and exit unpaved roads onto paved roads, or wash off trucks and any equipment leaving the site each trip;
- Employ a balanced cut/fill ration on construction sites, thus reducing haul truck trip emissions;
- Construction sites/site operator shall comply with Bay Area Air Quality Management District Regulation 6, Rule 1- Particulate Matter;
- Use an emissions calculator in the planning of every construction project that uses the proposed equipment fleet and hours of use to project reactive organic gases, nitrogen oxides, particulate matter, and carbon dioxide emissions, then quantify the reductions achievable through the use of cleaner/newer equipment; and
- All off-road construction vehicles must be alternative fuel vehicles, or diesel-powered vehicles with the most recent ARB-certified tier or better engines or retrofitted/repowered to meet equivalent emissions standards.

Implementation of these mitigation measures would be expected to reduce the direct, short-term impact of most individual construction projects to a less-than-significant level for the region overall. However, additional analysis and mitigation may be required for some construction projects; these mitigation measures shall be identified in project-level environmental assessments. Because the location and duration of specific construction projects is still unknown, and yet localized construction-related air quality impacts are potentially disruptive and unpleasant for

households, businesses, and even communities, this CEQA analysis concludes that despite proposed mitigation measures, the potential impact of construction-related emissions remains significant and unavoidable.

Cumulative Impact

2.2-2 Emissions of ROG, NO_x, and CO would decrease substantially compared to existing conditions. (*Beneficial*)

As shown in Table 2.2-6, the emissions for criteria pollutants ROG, NO_x, and CO from mobile sources would decrease substantially between 2006 and the 2035 horizon for the proposed Project. When compared to existing conditions (2006), the proposed Project reduces ROG emissions by 72 percent, NO_x emissions by 80 percent, and CO emissions by 78 percent. This is a direct and beneficial impact. The major reason for these reductions is the increasingly stringent emission controls ARB has adopted for new vehicle engines and fuels over the past few decades. Other contributors include emission-control devices, the Enhanced Smog Check Program, and fleet turnover wherein older polluting cars are retired and replaced with newer and substantially less polluting cars.

Furthermore, relative to the No Project alternative, the Proposed Project would result in emissions reductions of ROG (0.7 percent reduction), NO_x (0.8 percent reduction) and CO (1.3 percent reduction) due to the implementation of the proposed Transportation 2035 Plan, coupled with the emission strategies described above.

Table 2.2-6: Emission Estimates for Criteria Pollutants using EMFAC2007 Factors (tons per day)

	2006	2035		Change 2006 to 2035 Project		Change 2035 No Project to 2035 Project	
		No Project	Project	Numerical	Percent	Numerical	Percent
ROG	131.1	37.5	37.2	-93.9	-72%	-0.3	-0.7%
NO _x	209.8	43.2	42.8	-166.9	-80%	-0.3	-0.8%
CO	1,235.4	272.3	268.7	-966.7	-78%	-3.6	-1.3%
PM ₁₀	65.7	84.7	84.1	18.3	28%	-0.6	-0.7%
PM _{2.5}	17.2	20.7	20.4	3.2	19%	-0.2	-1.2%

Source: Metropolitan Transportation Commission, 2008

Mitigation Measures

None required.

Cumulative Impact

2.2-3 Implementation of Transportation 2035 Plan projects, combined with projected regional growth, would result in increased emissions of PM₁₀ and PM_{2.5} over existing conditions. (*Significant Cumulative Impact, Contribution Not Cumulatively Considerable*)

As shown in Table 2.2-6 (above), PM₁₀ and PM_{2.5} emissions from mobile sources would increase by 28 percent and 19 percent, respectively, compared to existing conditions. The higher levels of particulate matter emissions in 2035 conditions are due to the fact that these emissions are strongly influenced by the 32 percent growth in vehicle miles of travel (which affects entrained dust), with some contributions from tire and brake wear and exhaust. The reason particulate matter emissions from mobile sources are not increasing the same amount as VMT (32 percent) is the stringent emission control ARB has adopted for new vehicle engines, particularly diesel engines.¹¹ Note that daily VMT and daily VHD are increasing when comparing the proposed Project to existing conditions, but to a large degree, these increases are offset by the regulatory and fleet improvements. PM control programs implemented by local Air Districts also contribute to the emission reductions relative to VMT. Nonetheless, this increase in PM emissions overall represents a potentially significant cumulative impact.

As described in the transportation analysis, the increase in VMT is largely due to regional population and employment growth. There would in fact be 0.7 percent fewer PM₁₀ and 1.2 percent PM_{2.5} emissions from the proposed Project relative to the No Project alternative. This decrease is due to less congested driving from implementation of improvements in the proposed Transportation 2035 Plan, coupled with State and regional particulate matter programs described above.

Furthermore, there are already ongoing State and regional efforts to mitigate the effects of particulate matter emissions. For instance, the ARB adopted a Diesel Risk Reduction Plan (DRRP) in October 2000, and has since adopted a series of regulations to require cleaner diesel fuel, to restrict idling of diesel engines, and to reduce emissions from both old and new on-road and off-road diesel engines. In 2005, MTC implemented a \$14 million program to retrofit 1,700 diesel bus engines operated by Bay Area transit to reduce particulate matter emissions, and in 2006, MTC and the BAAQMD implemented a \$2 million incentive program to reduce emissions from solid waste collection vehicle fleets that operate within the BAAQMD. Furthermore, the BAAQMD implements a variety of incentive programs that help fleet operations offset the cost of purchasing low-emission vehicles, re-powering old polluting heavy duty engines with cleaner, lower-emission engines, and installing control devices that reduce particulate and NO_x. As part of the proposed Transportation 2035 Plan, \$45 million in discretionary funds are committed to a regional Particulate Matter Emission Reductions Program.

¹¹ Beyond those regulations factored into the analysis, on December 12, 2008 ARB adopted two critical regulations directly aimed at cleaning up harmful emissions from heavy-duty diesel trucks that operate in California – (1) Statewide Truck and Bus rule will require truck owners to install diesel exhaust filters on their rigs, with nearly all vehicles upgraded by 2014, and (2) Heavy Duty Vehicle Greenhouse Gas emission reduction measure that requires long-haul truckers to install fuel efficient tires and aerodynamic devices on their trailers that lower greenhouse gas emissions and improve fuel economy. See also <http://www.arb.ca.gov/newsrel/nr121208.htm> for more information.

In conclusion, since emissions would decrease under the proposed Project compared to future conditions without the proposed Transportation 2035 Plan, the proposed Project's contribution to the overall significant cumulative impact would not be cumulatively considerable. Nonetheless, in recognition of the influence of particulate matter emissions on air quality and health, the following mitigation measures have been identified.

Mitigation Measures

The following mitigation measures are recommended to address the overall cumulative increase in PM emissions.

2.2(b) MTC and BAAQMD, in partnership with ARB and other partners who would like to participate, shall work to leverage existing air quality and transportation funds and seek additional funds to continue to implement the BAAQMD's Lower-Emission School Bus Program (LESBP) to retrofit older diesel school buses with emission control devices and replace older school buses with clean school buses, and to develop and implement other similar programs aimed at retrofits and replacements of heavy duty fleet vehicles.

2.2(c) MTC and BAAQMD, in partnership with the Port of Oakland, ARB, and other partners who would like to participate, shall work together to identify, prioritize and implement actions beyond those identified in the Statewide Goods Movement Emission Reduction Plan to reduce diesel PM and other air emissions.

2.2(d) MTC and BAAQMD, in partnership with the Port of Oakland, ARB, and other partners who would like to participate, shall work together to secure incentive funding that may be available through the Carl Moyer Memorial Air Quality Standards Attainment Program to reduce port-related emissions.

2.2(e) MTC and BAAQMD, in partnership with the Port of Oakland, ARB, and other partners who would like to participate, shall work together to secure Proposition 1B Goods Movement Emission Reduction Program funds to invest in Bay Area related programs. These funds directly support early and accelerated diesel PM reduction programs and can help ease the transition into compliance with adopted and proposed ARB regulations.

2.2(f) MTC and BAAQMD, in partnership with the Port of Oakland, ARB, and other partners who would like to participate, shall work together to develop and seek resources for the San Francisco Bay Area Green Ports Initiative,¹² which is a program to reduce air pollution from trucks, ships and other equipment associated with Bay Area port operations.

Despite feasible mitigation, this overall cumulative impact is assumed to remain significant and unavoidable. However, the proposed Project's contribution to the overall cumulative impact is not cumulatively considerable.

¹² For more information about the BAAQMD's Green Ports Initiative, see http://www.baaqmd.gov/brd/brddirectors/agenda_packets/2008/brd_agenda_111908.pdf

Cumulative Impact

2.2-5 Emissions of diesel particulate matter, 1, 3-butadiene, and benzene (toxic air contaminants) would decrease substantially compared to existing conditions (*No Adverse Impact*)

As shown in Table 2.2-7, there would be a 77 percent decrease in diesel particulate matter, a 78 percent decrease in 1,3-butadiene, and a 76 percent decrease in benzene compared to existing conditions. These reductions can be attributed to California's state laws to evaluate and control TACs, namely AB 1807 that created the Toxic Air Contaminant Identification and Control Act, SB 2588 that established the Air Toxics "HOT Spots" Information and Assessment Act, and SB 656 that requires ARB and local Air Districts to identify control measures for particulate matter. Other state regulations that cut smog or other pollutants also reduce TACs, such as the standards for low emission vehicles, clean fuels, reformulated gasoline, diesel fuel specifications and ARB's Heavy Duty Diesel Inspection Programs. In addition, there are a number of regional programs in place to address particulate matter in general and TACs in particular, including the ARB, BAAQMD, and Port of Oakland's Bay Area Goods Movement Program that provide financial incentives to owners of equipment used in freight movement to upgrade to cleaner technologies¹³ and numerous Port of Oakland Clean Air Programs such as the Maritime Air Quality Improvement Plan, Comprehensive Truck Management Plan, Truck Air Quality Project, Vision 2000 Program and Air Emissions, and West Oakland Particulate Air Quality Monitoring Program.¹⁴

The toxic air contaminant emissions would continue to decline in 2035 with the implementation of the proposed Project relative to the No Project alternative, coupled with the state and regional programs described above. Though the proposed Project would result in an incremental benefit related to the No Project alternative, the majority of the beneficial cumulative impact relative to existing conditions is a result of existing State and local regulations. Therefore, this analysis concludes the proposed Project has no adverse cumulative impact on toxic air contaminants from on-road mobile sources.

Table 2.2-7: Emission Estimates for Toxic Air Contaminants Pollutants

	2035		2035 Project	Change 2006 to 2035 Project		Change 2035 No Project to 2035 Project	
	2006	No Project		Numerical	Percent	Numerical	Percent
(kilograms per day)							
Diesel PM	3,073	728	716	-2,356	-77%	-12	-1.6%
1,3 Butadiene	241	53	53	-188	-78%	-0.1	-0.3%
Benzene	1,284	316	311	-973	-76%	-5	-1.7%

Source: Metropolitan Transportation Commission, 2008

¹³ Additional information about the ARB, BAAQMD, and Port of Oakland's Bay Area Goods Movement Program is available at: http://www.baaqmd.gov/pln/grants_and_incentives/gm/index.htm

¹⁴ Additional information about the Port of Oakland's Clean Air Programs at the Port is available at: <http://www.portofoakland.com/enviro/m/programs.asp>

Mitigation Measures

None required. However, see also mitigation measures for PM₁₀ and PM_{2.5} emissions above which have co-benefits for addressing TAC emissions.

2.3 Land Use and Housing

The San Francisco Bay Area has grown from the sparsely populated Native American and then Spanish settlements of the past to an urban area of nearly seven million people today. Land uses in the Bay Area include one of the most densely populated urban centers in the United States (the City of San Francisco) as well as open hills and shorelines, growing suburban areas, and valued agricultural conservation areas.

This chapter evaluates the potential effects of the proposed Transportation 2035 Plan on land use and housing in the Bay Area. It describes trends in use of land for residential and employment purposes and trends in the density of new development projected by the Association of Bay Area Governments (ABAG).¹ This chapter also describes the projected housing trends for the Bay Area through 2035. The impact analysis addresses the potential impacts of the proposed Transportation 2035 Plan on the conversion or loss of important agricultural lands, open space, or natural areas; project consistency with adopted land use plans; and community displacement and disruptions, including potential loss of housing and businesses and separation of people from community resources.

ENVIRONMENTAL SETTING

PHYSICAL SETTING

The study area consists of the nine counties in the Bay Area—Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma. The physical setting includes current and projected land use patterns, urban development trends and densities, agricultural uses, and housing.

Land Use Patterns

Since World War II, the San Francisco Bay Area has grown from a primarily agricultural region with one major city (San Francisco) to the fifth most populous metropolitan region in the United States² with multiple centers of employment, residential development, and peripheral agricultural areas. The pattern of land uses in the Bay Area includes a mix of open space, agriculture, intensely developed urban centers, a variety of suburban employment and residential areas, and scattered older towns. This pattern reflects the landforms that physically define the region, the Bay, rivers, and valleys. Major urban areas are located around the Bay, with the older centers close to the Golden Gate. Newer urban areas are found in Santa Clara County to the south, the valleys of eastern Contra Costa and Alameda Counties, and Sonoma and Solano Counties to the north. The Pacific coast and the northern valleys are primarily in agricultural and open space use, while the

¹ ABAG serves as the regional Census Data Center and publishes its own forecasts. Detailed information on current and future population, employment, and housing are available at the census tract level. ABAG's biennial Projections series provides long-term forecasts through a series of computer models that have been recognized in academic literature and are described in detail on ABAG's website. ABAG's demographic and land use forecasts are widely used by transportation and air quality agencies, local government, and private industry.

² Census 2000.

agricultural areas adjoining the Central Valley have seen substantial suburban development in recent years, particularly in Solano County and eastern Contra Costa County.

Extent of Urban Development

The Bay Area is comprised of nine counties, including Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma. According to ABAG, only about 18 percent of the region's approximately 7,000 square miles was developed in 2005.³ The remaining undeveloped area includes open space and agricultural lands as well as water bodies (excluding the San Francisco Bay) and parks. The amount of land developed in each of the nine counties varies from a low of five percent in Napa County to a high of 51 percent in San Francisco. Residential uses continue to consume the greatest amount of urban land, 72 percent, while employment related land uses occupy about 28 percent.⁴ State highways, local roads, sidewalks, and parking typically consume about 20 percent of the land in each category, and accordingly, about 20 percent of the developed land in the Bay Area.

The Bay Area includes 101 cities, with San Jose, San Francisco, and Oakland representing the largest urbanized centers. Other major urban centers have formed throughout the region leading to the overall urbanization as illustrated in Figure 2.3-1.

³ Association of Bay Area Governments, 2007.

⁴ Ibid.

Density of Development

Residential and employment densities vary widely within the region, with the highest densities associated with the older areas. Densities are of interest because of the way that they affect transportation options for Bay Area residents. In general, low density development is more dispersed and requires greater reliance on autos for many trips, while higher residential densities (on the order of 7.0 to 30.0 units/acre) can sustain significant transit service.⁵ A density of 8.0 units/acre is typically the minimum density required to justify economically a fixed bus system operating at half-hour headways.⁶

Average densities are shown for the MTC superdistricts in Table 2.3-1⁷ and for counties in Table 2.3-2. The Bay Area averages for residential and employment density are just over 4 units per residential acre and 15 jobs per commercial or industrial acre. The highest residential and employment densities occur in downtown San Francisco (which includes the North Beach and Chinatown neighborhoods) with 127 households per residential acre and 238 jobs per commercial or industrial acre.

With respect to residential uses, after San Francisco, the Berkeley/Albany, Daly City/San Bruno, and Sunnyvale/Mountain View areas have the highest densities, while Healdsburg/Cloverdale, St. Helena/Calistoga, Santa Rosa/Sebastopol, and Petaluma/Sonoma have the lowest densities. Areas with the highest employment densities include San Francisco, Berkeley/Albany, and Walnut Creek/Lamorinda. Areas with the lowest employment densities include Healdsburg/Cloverdale, Antioch/Pittsburg, and Fairfield/Vacaville.

At the county level, with the exception of San Francisco County, the highest employment densities occur in Santa Clara and Marin counties, while the highest residential densities occur in Alameda and Santa Clara counties. The lowest residential densities can be found in Sonoma County; the lowest employment densities in Solano County. Figure 2.3-2 illustrates 2005 population density in the region by traffic analysis zone.

⁵ Pushkarev, and Zupan, 1977.

⁶ Cervero, 1986.

⁷ MTC divides the Bay Area into 34 superdistricts. These superdistricts are comprised of 1,454 transportation analysis zones (TAZs) used as areas of aggregation for describing Bay Area population and employment levels, and for analysis, calibration, and presentation of MTC's transportation model (BAYCAST-90) output.

Table 2.3-1: Density of Development in the Bay Area by MTC Superdistrict, 2005

	Superdistrict	Employment Density			Residential Density		
		Jobs	Commercial/ Industrial Acres	Density	Households	Residential Acres	Density
1	Downtown San Francisco	331,397	1,395	237.6	70,716	556	127.2
2	Richmond District	81,436	969	84.0	104,679	2,301	45.5
3	Mission District	114,322	3,066	37.3	113,963	4,111	27.7
4	Sunset District	25,924	435	59.6	49,563	2,565	19.3
5	Daly City/San Bruno	137,063	8,550	16.0	98,262	10,088	9.7
6	San Mateo/Burlingame	85,902	4,943	17.4	83,039	17,192	4.8
7	Redwood City/Menlo Park	114,381	9,641	11.9	78,769	35,125	2.2
8	Palo Alto/Los Altos	125,826	4,400	28.6	70,792	18,237	3.9
9	Sunnyvale/Mountain View	302,932	16,908	17.9	93,004	11,265	8.3
10	Saratoga/Cupertino	116,455	5,235	22.2	119,569	28,670	4.2
11	Central San Jose	138,295	5,706	24.2	100,770	12,780	7.9
12	Milpitas/East San Jose	102,208	6,355	16.1	105,457	19,473	5.4
13	South San Jose/Almaden	44,352	3,131	14.2	73,394	15,196	4.8
14	Gilroy/Morgan Hill	42,798	2,957	14.5	32,713	14,392	2.3
15	Livermore/Pleasanton	127,840	9,100	14.0	68,303	22,858	3.0
16	Fremont/Union City	133,758	10,312	13.0	102,646	19,338	5.3
17	Hayward/San Leandro	136,717	12,117	11.3	125,987	21,874	5.8
18	Oakland/Alameda	222,831	13,744	16.2	176,468	18,833	9.4
19	Berkeley/Albany	109,128	3,413	32.0	70,384	5,911	11.9
20	Richmond/El Cerrito	69,623	8,307	8.4	89,129	12,077	7.4
21	Concord/Martinez	110,755	12,380	8.9	86,481	16,143	5.4
22	Walnut Creek/Lamorinda	85,095	2,725	31.2	60,396	19,585	3.1
23	Danville/San Ramon	60,654	2,273	26.7	45,075	17,493	2.6
24	Antioch/Pittsburg	52,916	10,028	5.3	87,229	19,206	4.5
25	Vallejo/Benicia	50,908	6,607	7.7	53,002	7,969	6.7
26	Fairfield/Vacaville	99,620	18,550	5.4	89,038	37,393	2.4
27	Napa	45,080	2,599	17.3	34,774	8,581	4.1
28	St. Helena/Calistoga	25,615	2,181	11.7	14,496	10,440	1.4
29	Petaluma/Sonoma	76,360	11,045	6.9	62,714	39,443	1.6
30	Santa Rosa/Sebastopol	116,542	9,518	12.2	87,157	59,362	1.5
31	Healdsburg/Cloverdale	27,560	11,795	2.3	31,929	47,530	0.7
32	Novato	27,810	2,414	11.5	22,566	7,041	3.2
33	San Rafael	59,091	4,320	13.7	42,243	14,656	2.9
34	Mill Valley/Sausalito	48,569	1,920	25.3	38,371	9,195	4.2

Source: MTC's Superdistrict and County Summaries of ABAG's Projections 2007 2000-2035 Data Summary, 2007

Table 2.3-2: Density of Development in the Bay Area by County, 2005

County	Employment Density			Residential Density		
	Jobs	Commercial/ Industrial Acres	Density	Households	Residential Acres	Density
San Francisco	553,079	5,865	94.3	338,921	9,533	35.6
San Mateo	337,346	23,134	14.6	260,070	62,405	4.2
Santa Clara	872,866	44,692	19.5	595,699	120,013	5.0
Alameda	730,274	48,686	15.0	543,788	88,814	6.1
Contra Costa	379,043	35,713	10.6	368,310	84,504	4.4
Solano	150,528	25,157	6.0	142,040	45,362	3.1
Napa	70,695	4,780	14.8	49,270	19,021	2.6
Sonoma	220,462	32,358	6.8	181,800	146,335	1.2
Marin	135,470	8,654	15.7	103,180	30,892	3.3
Bay Area	3,449,763	229,039	15.1	2,583,078	606,879	4.3

Source: MTC's Superdistrict and County Summaries of ABAG's Projections 2007 2000-2035 Data Summary, 2007

Land Use and Future Densities

The amount of developed land in the region is forecast to increase by over 90,000 acres between 2005 and 2035, an increase of 2 percent.⁸ This regional development will result in just over 20 percent of all Bay Area land being developed by 2035. Overall regional population density has been consistent from 2000 to 2005, but it is projected to increase marginally over the next 25 years, from 12 to about 13 persons per residential acre. Projected population density for year 2035 is illustrated in Figure 2.3-3. Similarly, the regional household density is projected to go from about 4 households per acre in 2005 to 5 households per acre by 2035. The relatively small increases in residential density are the result of increases in residential acres in urban and urban core areas (as a percent of all acres) as well as increases in population in urban and urban core areas, both absolutely and as a share of regional population. This infill development within the established cities can contribute to greater transit use in corridors where transit is successful. Table 2.3-3 summarizes this information.

⁸ Association of Bay Area Governments, 2007.

Figure 2.3-2
Existing Population Density (2005)

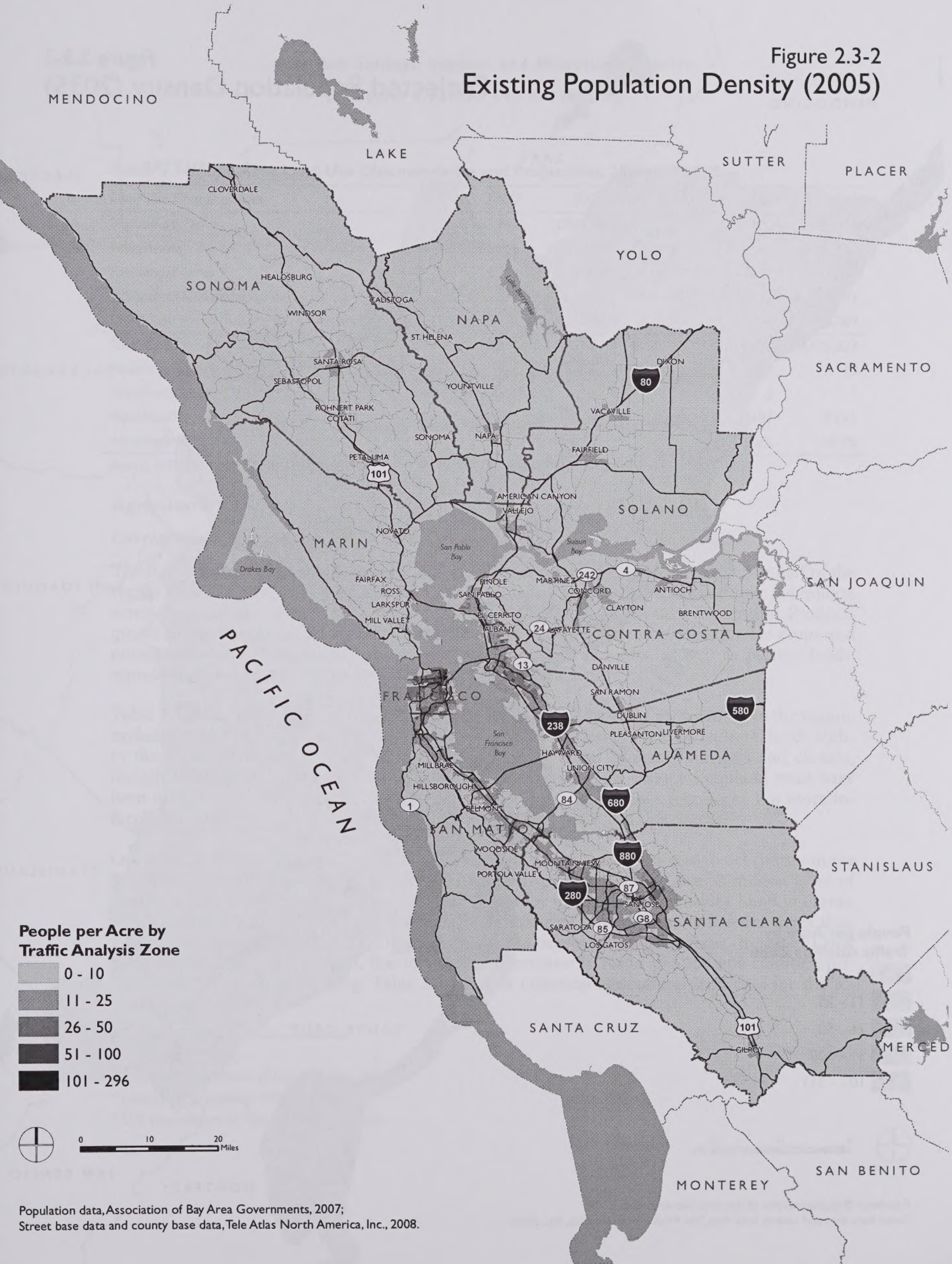


Figure 2.3-3
Projected Population Density (2035)

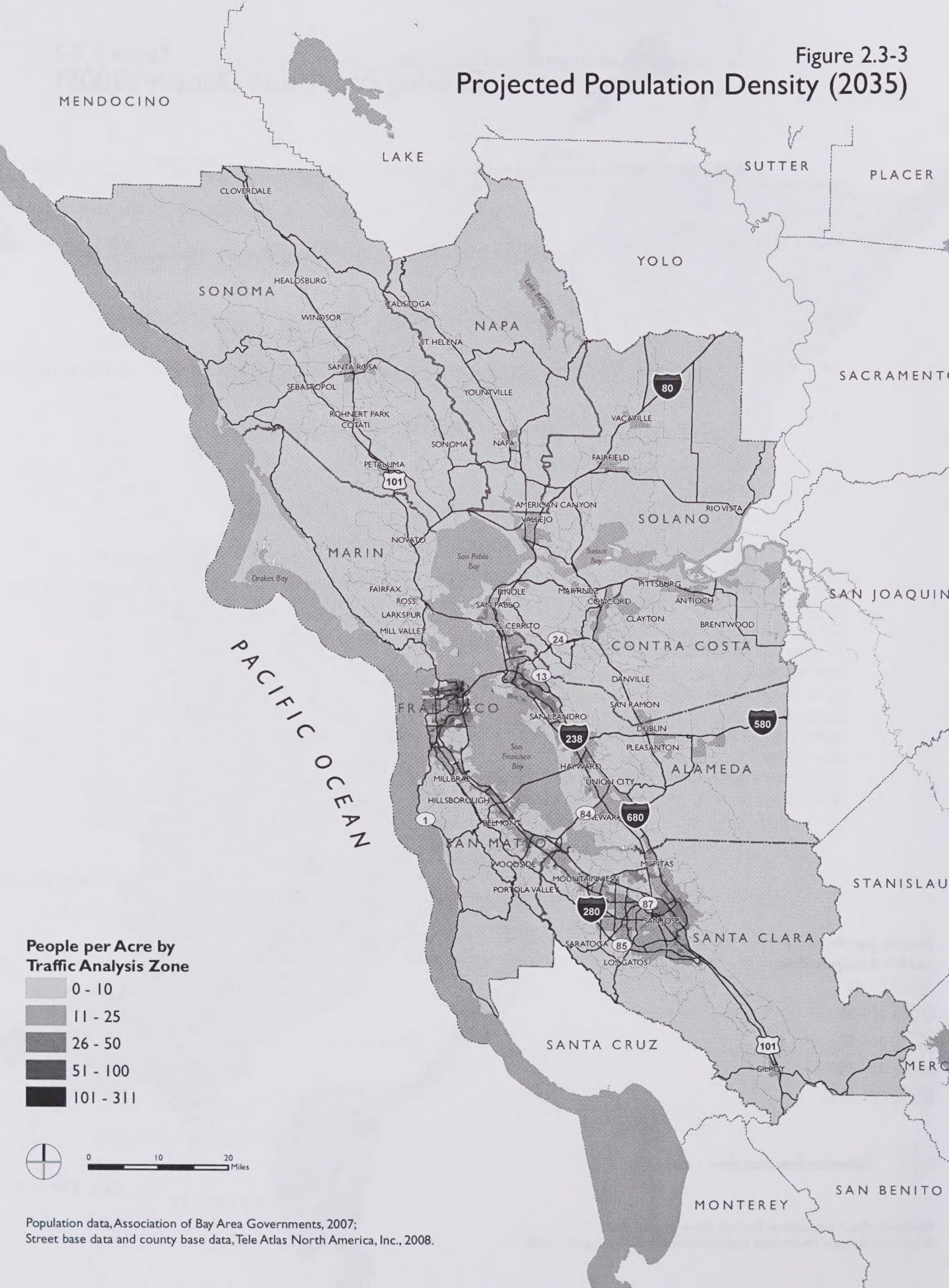


Table 2.3-3: Bay Area Land Use Characteristics and Projections, 2000-2035

<i>Land Use Characteristics</i>	<i>2000</i>	<i>2005</i>	<i>2015</i>	<i>2025</i>	<i>2035</i>
Population	6,783,762	7,096,099	7,729,998	8,389,600	9,031,498
Households	2,466,015	2,583,078	2,818,761	3,059,073	3,292,521
Residential Acres	586,879	606,879	639,913	662,657	681,512
Commercial-Industrial Acres	229,039	229,039	236,082	241,597	244,797
Developed Acres (Residential, Commercial-Industrial)	815,918	835,918	875,995	904,254	926,309
<i>Total Acres</i>	<i>4,575,237</i>	<i>4,575,237</i>	<i>4,575,237</i>	<i>4,575,237</i>	<i>4,575,237</i>
<i>Population/Residential Acre</i>	<i>12</i>	<i>12</i>	<i>12</i>	<i>13</i>	<i>13</i>
<i>Households/Residential Acre</i>	<i>4</i>	<i>4</i>	<i>4</i>	<i>5</i>	<i>5</i>
<i>Population/Household</i>	<i>2.693</i>	<i>2.691</i>	<i>2.688</i>	<i>2.691</i>	<i>2.695</i>
<i>Percentage of Total Acres Developed</i>	<i>17.8%</i>	<i>18.3%</i>	<i>19.1%</i>	<i>19.8%</i>	<i>20.2%</i>

Source: MTC's Superdistrict and County Summaries of ABAG's Projections 2007 2000-2035 Data Summary, 2007

Agricultural Land

Current and Historical Agricultural Uses

The Bay Area has a significant amount of land in agricultural uses. In 2006, just over half of the region's approximately 4.5 million acres were classified as agricultural land.⁹ Of these 2.4 million acres of agricultural land, over 70 percent (about 1.7 million acres) are used for grazing. Products grown in the Bay Area include field crops, fruit and nut crops, seed crops, vegetable crops and nursery products. Field crops, which include corn, wheat, and oats, as well as pasture lands, represent approximately 63 percent of Bay Area agricultural land.¹⁰

Table 2.3-4 shows the acres of agricultural lands, by farmland type, for each county in the region, excluding San Francisco County. Figure 2.3-4 shows the location of these agricultural lands within the region. The classification of agricultural lands is based primarily on soils and climate, though Prime Farmland, Farmland of Statewide Importance, and Unique Farmland must have been used for agricultural production at some time during the previous four years. For more information about farmland classification, see the *Regulatory Setting* in this chapter.

Over the last 50 years, a large amount of agricultural land has been converted to urban uses in the Bay Area. According to the U.S. Census of Agriculture, the region had over 3 million acres of Land in Farms in 1954. By 2002 (the most recent year for which data is available), Land in Farms, which includes pasture lands, had decreased by 32 percent, almost a million fewer acres than 1954.¹¹ During this same period, Cropland Harvested decreased by 44 percent. Irrigated Land, however, increased by 7 percent, due to very large increases in Napa and Sonoma counties, primarily due to vineyard planting. Table 2.3-5 shows historical agricultural land data for the region's nine counties.

⁹ California Department of Conservation, 2006.

¹⁰ County Crop Reports, 2006.

¹¹ U.S. Department of Agriculture, 1978, 2002.

Table 2.3-4: Bay Area Agricultural Lands

	Alameda	Contra Costa	Marin	Napa	San Mateo	Santa Clara	Solano	Sonoma ^a	Region
Prime Farmland ^b	4,725	29,938	7	31,999	2,356	20,766	139,536	33,803	263,130
Farmland of Statewide Importance ^c	1,391	8,092	459	9,679	186	4,460	7,164	18,624	50,055
Unique Farmland ^d	2,323	3,589	303	16,358	2,387	2,452	11,036	33,300	71,748
Farmland of Local Importance ^e	0	52,071	65,602	18,991	3,496	6,113	0	76,384	222,657
Important Farmland Subtotal	8,439	93,690	66,371	77,027	8,425	33,791	157,736	162,111	607,590
Grazing Land ^f	244,947	168,662	89,514	179,299	46,292	388,510	202,826	420,323	1,740,373
Agricultural Land Total	253,386	262,352	155,885	256,326	54,717	422,301	360,562	582,434	2,347,963

^a Agricultural land use for Sonoma County uses data from year 2004. Data for year 2006 was not available.

^b Farmland with the best combination of physical and chemical features able to sustain long term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields.

^c Similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store moisture.

^d Farmland of lesser quality soils used for the production of the state's leading agricultural crops. This land is usually irrigated, but may include nonirrigated orchards or vineyards.

^e Important to the local agricultural economy as determined by county's board of supervisors and local advisory committee.

^f Land on which the existing vegetation is suited to the grazing of livestock.

Source: California Department of Conservation, Division of Land Resource Protection, Farmland Mapping and Monitoring Program, 2006

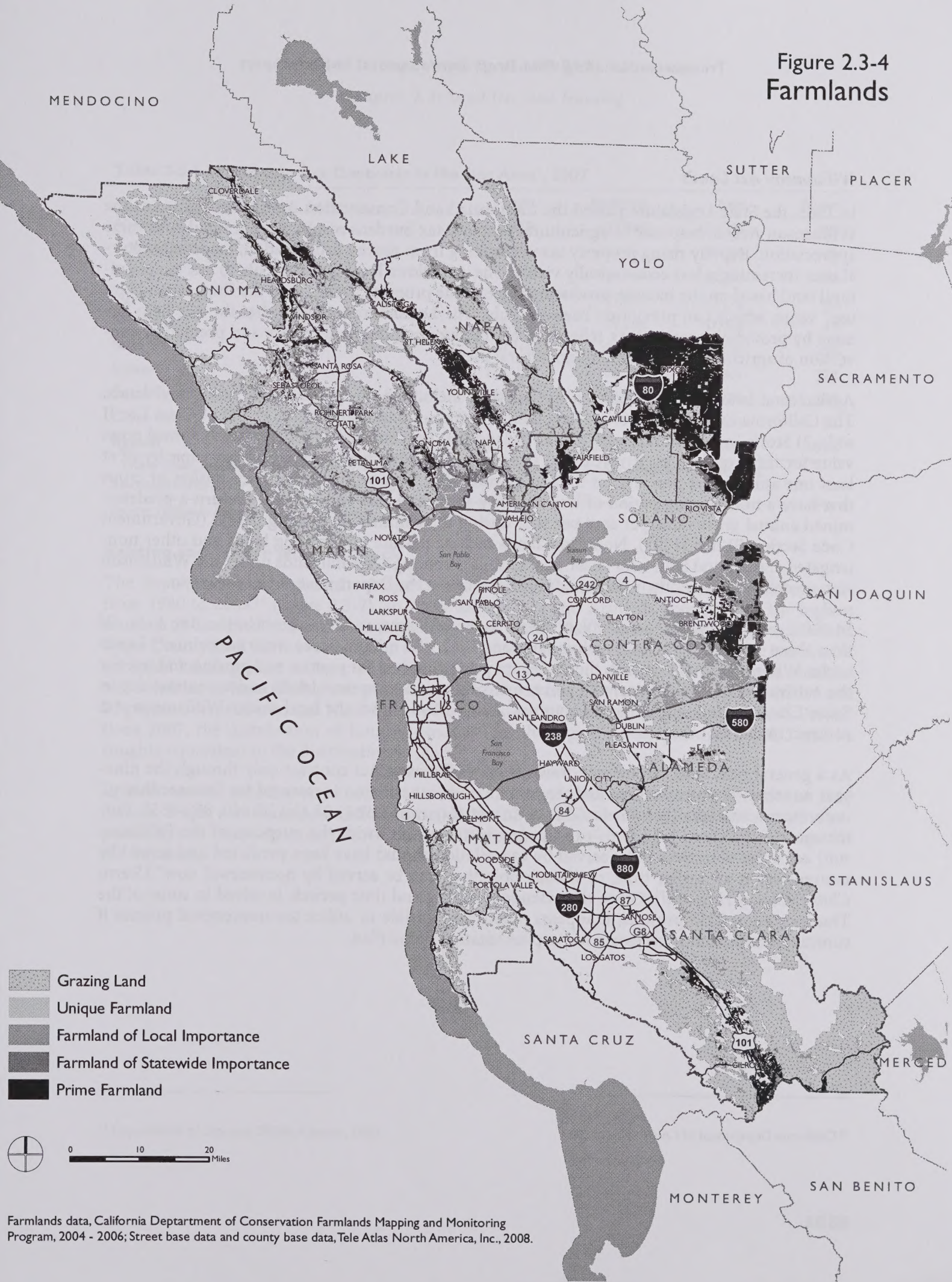
Table 2.3-5: Bay Area Agricultural Lands, 1954 and 2002

	1954			2002			Percent Change 1954-2002		
	Cropland Harvested	Land in Farms	Irrigated Land in Farms	Cropland Harvested	Land in farms	Irrigated Land ^a	Cropland Harvested	Land in farms	Land in Irrigated Farms
Alameda	59,548	316,994	22,599	7,926	218,094	6,185	-87%	-31%	-73%
Contra Costa	85,807	324,856	50,117	26,018	126,338	32,921	-70%	-61%	-34%
Marin	12,133	236,956	974	5,706	150,645	1,856	-53%	-36%	91%
Napa	52,168	311,907	8,390	52,838	237,548	52,874	1%	-24%	530%
San Francisco	88	307	n/a	n/a	n/a	7	-100%	-100%	n/a
San Mateo	24,194	84,247	6,623	6,273	41,530	4,849	-74%	-51%	-27%
Santa Clara	148,056	590,041	114,677	22,764	320,851	24,659	-85%	-46%	-78%
Solano	135,071	423,423	79,971	131,408	351,453	124,535	-3%	-17%	56%
Sonoma	98,053	761,832	20,231	91,537	627,227	75,901	-7%	-18%	275%
Region	615,118	3,050,563	303,582	344,470	2,073,686	323,787	-44%	-32%	7%

^a The names of categories for irrigated land have changed since 1954; this seems to be the closest match.

Source: U.S. Census of Agriculture, 1978, 2002

Figure 2.3-4 Farmlands



Williamson Act Lands

In 1965, the State Legislature passed the California Land Conservation Act (better known as the Williamson Act) in response to agricultural property tax burdens resulting from rapid land value appreciation. Rapidly rising property taxes, resulting from nearby urbanization, made agricultural uses increasingly less economically viable. The Act allows local governments to assess agricultural land based on the income-producing value of the property, rather than the “highest and best use” value, which had previously been the rule. The Legislature intended that the Act help farmers by providing property tax relief, and by discouraging the unnecessary and premature conversion of agricultural land to non-agricultural uses.

Agricultural land under Williamson Act contract includes both “prime” and “nonprime” lands. The California Land Conservation Acts defines prime agricultural land as: 1) USDA Class I or II soils; 2) Storie Index soil rating 80 to 100; 3) land that has returned a predetermined annual gross value for three of the past five years; 4) livestock-supporting land with a carrying capacity of at least one animal unit per acre; or 5) land planted with fruit or nut trees, vines, bushes or crops that have a non-bearing period of less than five years and that will normally return a predetermined annual gross value per acre per year during the commercial bearing period (Government Code Section 51200-51207). Nonprime lands include pasture and grazing lands and other non-irrigated agricultural land with lesser quality soils. Prime agricultural lands under the Williamson Act are defined differently from Prime Farmland under the Department of Conservation.

In 2007, over 1.2 million acres of land were under Williamson Act contract in the Bay Area. Of this, about 208,000 acres were prime farmland and 1.03 million acres were nonprime.¹² Lands under Williamson Act contract, therefore, are primarily used for pasture and grazing and not for the cultivation of crops. Nearly 70 percent of prime and nonprime lands under contract are in Santa Clara, Solano, and Sonoma counties. Table 2.3-6 shows the land under Williamson Act contract in the Bay Area.

As a general rule, land can be withdrawn from Williamson Act contract only through the nine-year nonrenewal process. Immediate termination via cancellation is reserved for “extraordinary,” unforeseen situations (See *Sierra Club v. City of Hayward* (1961) 28 Cal.3d 840, 852-855). Furthermore, it has been held that “cancellation is inconsistent with the purposes of the (Williamson) act if the objectives to be served by cancellation should have been predicted and served by nonrenewal at an earlier time, or if such objectives can be served by nonrenewal now” (*Sierra Club v. City of Hayward*). Given the extended phasing and time periods involved in some of the Transportation 2035 projects, it appears potentially feasible to utilize the nonrenewal process if contract termination is necessary for implementation of the Plan.

¹² California Department of Conservation, 2007.

Table 2-3.6 Williamson Act Contracts in the Bay Area¹, 2007

	<i>Prime</i>	<i>Nonprime</i>	<i>Total</i>	<i>Percent</i>
Alameda	2,459	133,066	135,525	11%
Contra Costa	9,559	37,749	47,308	4%
Marin	1,636	84,951	86,587	7%
Napa	18,294	51,884	70,178	6%
San Mateo ^a	3,070	43,988	47,058	4%
Santa Clara	10,316	302,322	312,638	25%
Solano	120,156	148,689	268,845	22%
Sonoma	42,321	230,937	273,258	22%
Cities	149	701	850	0%
Region	207,960	1,034,286	1,242,246	100%

¹ These totals include a small amount of non-Williamson Act land with other kinds of restrictive covenants.

^a Acreage enrolled for San Mateo is from 2006.

Source: California Department of Conservation, 2007

Existing and Future Housing Stock

The Bay Area has experienced a 34 percent increase in the number of occupied housing units from 1980 to 2008.¹³ (Table 2.3-7). In 2008, Santa Clara and Alameda counties had the highest number of occupied housing units in the Bay Area with 609,000 and 554,000 units, respectively. Napa County had the lowest number with 50,600 units. Between 2005 and 2035, the number of occupied housing units is expected to increase by 22 percent. Santa Clara and Alameda counties will continue to have the highest proportion of occupied housing units in the region with 24 and 21 percent, respectively, and Napa County the lowest with 2 percent. According to ABAG Projections 2007, the distribution of housing stock across the region's nine counties in 2035 will be roughly equivalent to the distribution in 2005.

In 2008, four of nine Bay Area counties had lower average household sizes than they did in 1980 (Marin, Napa, San Francisco, and Sonoma). Table 2.3-8 shows that household size overall is expected to stay relatively constant over the next 20 years, at 2.69 persons per household average for the Bay Area.

¹³ Department of Finance, 2008a; Census, 1980.

Part Two: Settings, Impacts, and Mitigation Measures

Chapter 2.3: Land Use and Housing

Table 2.3-7: Occupied Housing Units in the Bay Area (1980-2035)

	DOF	Census	ABAG Projections 2007									
	2008	1980	2005	2010	2015	2020	2025	2030	2035	Growth: 2005- 2035	% of Total Occ Units in 2005	% of Total Occ Units 2035
<i>County</i>												
Alameda	553,501	426,092	543,788	564,852	589,722	614,757	642,997	671,700	700,089	156,301	21%	21%
Contra Costa	385,733	241,534	368,310	385,400	405,420	425,480	446,590	466,430	485,240	116,930	14%	15%
Marin	104,113	88,723	103,180	105,340	107,930	110,490	112,810	114,970	116,800	13,620	4%	4%
Napa	50,588	36,624	49,270	51,470	53,650	55,740	57,210	58,640	59,650	10,380	2%	2%
San Francisco	344,792	298,956	338,921	348,334	357,806	367,432	377,050	386,682	396,309	57,388	13%	12%
San Mateo	263,252	225,201	260,070	267,230	277,090	287,470	296,870	304,660	312,030	51,960	10%	9%
Santa Clara	608,652	458,519	595,699	628,773	664,793	701,400	732,806	769,737	806,203	210,504	23%	24%
Solano	146,191	80,426	142,040	152,400	162,620	172,050	180,360	188,290	196,220	54,180	5%	6%
Sonoma	186,568	114,474	181,800	192,660	199,730	206,840	212,380	216,320	219,980	38,180	7%	7%
Region	2,643,390	1,970,549	2,583,078	2,696,459	2,818,761	2,941,659	3,059,073	3,177,429	3,292,521	709,443	100%	100%

Source: Department of Finance, 2008(a); Census, 1980; MTC's Superdistrict and County Summaries of ABAG's Projections 2007 2000-2035 Data Summary, 2007

Table 2.3-8: Average Household Size in the Bay Area (1980-2035)

<i>County</i>	<i>DOF</i>	<i>Census</i>	<i>ABAG Projections 2007</i>						
	<i>2008</i>	<i>1980</i>	<i>2005</i>	<i>2010</i>	<i>2015</i>	<i>2020</i>	<i>2025</i>	<i>2030</i>	<i>2035</i>
Alameda	2.74	2.55	2.72	2.73	2.72	2.71	2.71	2.72	2.72
Contra Costa	2.70	2.19	2.75	2.73	2.70	2.69	2.68	2.67	2.66
Marin	2.37	2.56	2.34	2.34	2.34	2.34	2.33	2.32	2.32
Napa	2.59	2.76	2.61	2.60	2.59	2.56	2.54	2.52	2.51
San Francisco	2.33	2.53	2.29	2.26	2.24	2.27	2.30	2.33	2.36
San Mateo	2.77	2.69	2.74	2.73	2.74	2.74	2.73	2.72	2.72
Santa Clara	2.97	2.43	2.91	2.92	2.92	2.93	2.93	2.92	2.91
Solano	2.81	2.58	2.85	2.88	2.90	2.90	2.90	2.90	2.90
Sonoma	2.53	2.82	2.57	2.58	2.56	2.53	2.53	2.53	2.53
Region	2.64	2.57	2.69	2.69	2.69	2.69	2.69	2.69	2.69

Source: Department of Finance, 2008(a); Census, 1980; MTC's Superdistrict and County Summaries of ABAG's Projections 2007 2000-2035 Data Summary, 2007

REGULATORY SETTING

The regulatory setting includes federal and State agencies and laws, local regulatory bodies, and local control mechanisms guiding agricultural, land use, and transportation decisions.

Federal Regulations

U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS)

The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) maps soils and farmland uses to provide comprehensive information necessary for understanding, managing, conserving and sustaining the nation's limited soil resources. In addition to many other natural resource conservation programs, the NRCS manages the Farmland Protection Program, which provides funds to help purchase development rights to keep productive farmland in agricultural uses. Working through existing programs, USDA joins with state, tribal, or local governments to acquire conservation easements or other interests from landowners.

Federal Farmland Protection Policy Act

The U.S. Department of Agriculture's (USDA's) Natural Resources Conservation Service (NRCS) oversees the Farmland Protection Policy Act (FPPA) (7 U.S. Code [USC] Section 4201 et seq.; see also 7 Code of Federal Regulations [CFR] 658). The FPPA (a subtitle of the 1981 Farm Bill) is national legislation designed to protect farmland. The FPPA states its purpose is to "minimize the extent to which federal programs contribute to the unnecessary conversion of farmland to non-agricultural uses." The FPPA applies to projects and programs that are sponsored or financed in whole or in part by the federal government. The FPPA does not apply to private construction projects subject to federal permitting and licensing, projects planned and completed without assistance from a federal agency, federal projects related to national defense during a national emergency, or projects proposed on land already committed to urban development. The FPPA spells out requirements to ensure federal programs to the extent practical are compatible with state, local, and private programs and policies to protect farmland and calls for the use of the Land Evaluation and Site Assessment (LESA) system to aid in analysis. Because MTC or its project sponsors may ultimately seek some federal funding for transportation improvements, the FPPA is considered in this document.

Department of Housing and Urban Development (HUD)

The Department of Housing and Urban Development (HUD) is the federal agency responsible for national policy and programs that address housing needs in the U.S. HUD aims to improve and develop the Nation's communities and enforce fair housing laws. HUD plays a major role in supporting homeownership by underwriting homeownership for lower- and moderate-income families through its mortgage insurance programs.

State Regulations

Coastal Commission

The Coastal Commission is one of California's two designated coastal management agencies that administer the federal Coastal Zone Management Act (CZMA) in California. In partnership with coastal cities and counties, it plans and regulates the use of land and water in the coastal zone.

Development activities, which are broadly defined by the CZMA to include (among others) construction of buildings, divisions of land, and activities that change the intensity of use of land or public access to coastal waters, generally require a coastal permit from either the Coastal Commission or the local government. CZMA gives State coastal management agencies regulatory control over all activities that may affect coastal resources including any new development, and highway improvement projects that use federal funds. The coastal zone, which was specifically mapped by the Legislature, covers an area larger than the State of Rhode Island. On land the coastal zone varies in width from several hundred feet in highly urbanized areas up to five miles in certain rural areas, and offshore the coastal zone includes a three-mile-wide band of ocean. The coastal zone established by the Coastal Act does not include San Francisco Bay, where development is regulated by the Bay Conservation and Development Commission (BCDC).

Bay Conservation and Development Commission (BCDC)

As the other designated coastal zone management agency, and pursuant to the McAteer-Petris Act, BCDC is designated as the agency responsible for the protection of the Bay and its natural resources and for the regulation of the development of the Bay and shoreline to their highest potential with a minimum of Bay fill. BCDC has jurisdiction over fill placement, materials extraction, and changes in the use of any land, water, or structure. For development projects, including transportation improvements, BCDC jurisdiction includes the Bay itself (including San Pablo and Suisun Bays, sloughs, and certain creeks) and, in general, a 100-foot band along the Bay shoreline.

California Farmland Conservancy Program

The California Farmland Conservancy Program (Public Resources Code Section 10200 et seq.) supports the voluntary granting of agricultural conservation easements from landowners to qualified nonprofit organizations, such as land trusts, as well as local governments. Conservation easements are voluntarily established restrictions that are permanently attached to property deeds, with the general purpose of retaining land in its natural, open-space, agricultural, or other condition while preventing uses that are deemed inconsistent with the specific conservation purposes expressed in the easements. Agricultural conservation easements define conservation purposes that are tied to keeping land available for continued use as farmland. Such farmlands remain in private ownership, and the landowner retains all farmland use authority, but the farmland is restricted in its ability to be subdivided or used for nonagricultural purposes, such as urban uses. Potential impacts on conservation easements would be addressed in subsequent project-level documents.

Department of Housing and Community Development (HCD)

In response to state population and household growth, and to ensure the availability of affordable housing for all income groups, the State Department of Housing and Community Development (HCD) is responsible for determining the regional housing need for all jurisdictions in California.

Williamson Act and Farmland Security Zone Contracts

The California Land Conservation Act (Government Code Section 51200 et seq.) of 1965, commonly known as the Williamson Act, provides a tax incentive for the voluntary enrollment of agricultural and open space lands in contracts between local government and landowners. The contract enforceably restricts the land to agricultural and open space uses and compatible uses defined in state law and local ordinances. An agricultural preserve, which is established by local

government, defines the boundary of an area within which a city or county will enter into contracts with landowners. Local governments calculate the property tax assessment based on the actual use of the land instead of the potential land value assuming full development.

Williamson Act contracts are for 10 years and longer. The contract is automatically renewed each year, maintaining a constant, 10-year contract, unless the landowner or local government files to initiate nonrenewal. Should that occur, the Williamson Act would terminate 10 years after the filing of a notice of nonrenewal. Only a landowner can petition for a contract cancellation. Tentative contract cancellations can be approved only after a local government makes specific findings and determines the cancellation fee to be paid by the landowner.

The State of California has the following policies regarding public acquisition of and locating public improvements on lands in agricultural preserves and on lands under Williamson Act contracts (Government Code Section 51290–51295):

- State policy is to avoid locating federal, state, or local public improvements and improvements of public utilities, and the acquisition of land, in agricultural preserves.
- State policy is to locate public improvements that are in agricultural preserves on land other than land under Williamson Act contract.
- State policy is that any agency or entity proposing to locate such an improvement, in considering the relative costs of parcels of land and the development of improvements, give consideration to the value to the public of land, particularly prime agricultural land, in an agricultural preserve.

Since 1998, another option in the Williamson Act Program has been established with the creation of Farmland Security Zone contracts. A Farmland Security Zone is an area created within an agricultural preserve by a board of supervisors upon the request of a landowner or group of landowners. Farmland Security Zone contracts offer landowners greater property tax reduction and have a minimum initial term of 20 years. Like Williamson Act contracts, Farmland Security Zone contracts renew annually unless a notice of nonrenewal is filed. Potential cancellation of Williamson Act and Farmland Security Zone contracts would be addressed in subsequent project-level documents.

Farmland Mapping and Monitoring Program

The Farmland Mapping and Monitoring Program (FMMP) is the only statewide land use inventory conducted on a regular basis. The California Department of Conservation administers the FMMP, under which it maintains an automated map and database system to record changes in the use of agricultural lands. Farmland under the FMMP is listed by category—Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance. The farmland categories listed under the FMMP are described below. The categories are defined pursuant to USDA land inventory and monitoring criteria, as modified for California.

Prime Farmland

Prime Farmland is land with the best combination of physical and chemical features to sustain long-term production of agricultural crops. These lands have the soil quality, growing season, and moisture supply necessary to produce sustained high yields. Soil must meet the physical and

chemical criteria determined by the NCRS. Prime Farmland must have been used for production of irrigated crops at some time during the 4 years prior to the mapping date by the FMMP.

Farmland of Statewide Importance

Farmland of Statewide Importance is similar to Prime Farmland but with minor differences, such as greater slopes or a lesser ability of the soil to store moisture. Farmland of Statewide Importance must have been used for production of irrigated crops at some time during the 4 years prior to the mapping date.

Unique Farmland

Unique Farmland has lesser quality soils than Prime Farmland or Farmland of Statewide Importance.

Unique Farmland is used for the production of the state's leading agricultural crops. These lands are usually irrigated but may include nonirrigated orchards or vineyards found in some climatic zones in California. Unique Farmland must have been used for crops at some time during the 4 years prior to the mapping date.

Farmland of Local Importance

Farmland of Local Importance is farmland that is important to the local agricultural community as determined by each county's board of supervisors and local advisory committees.

Regional/Local Regulations

Association of Bay Area Governments (ABAG)

Through its role as the Bay Area's council of governments (COG), ABAG has been designated by the State and federal governments as the official comprehensive planning agency for the Bay Area. ABAG reviews projects of regional significance for consistency with regional plans and is also responsible for preparation of the Regional Housing Needs Assessment (RHNA), pursuant to California Government Code Section 65584(a). ABAG's locally adopted Regional Housing Needs Allocation (2007-2014)(approved by the ABAG Board May 15, 2008), along with the San Francisco Bay Area Housing Needs Plan, 2007-2014 (released June 5, 2008) provide a policy guide for planning the region's housing, economic development, environmental quality, transportation, recreation, and health and safety.

FOCUS

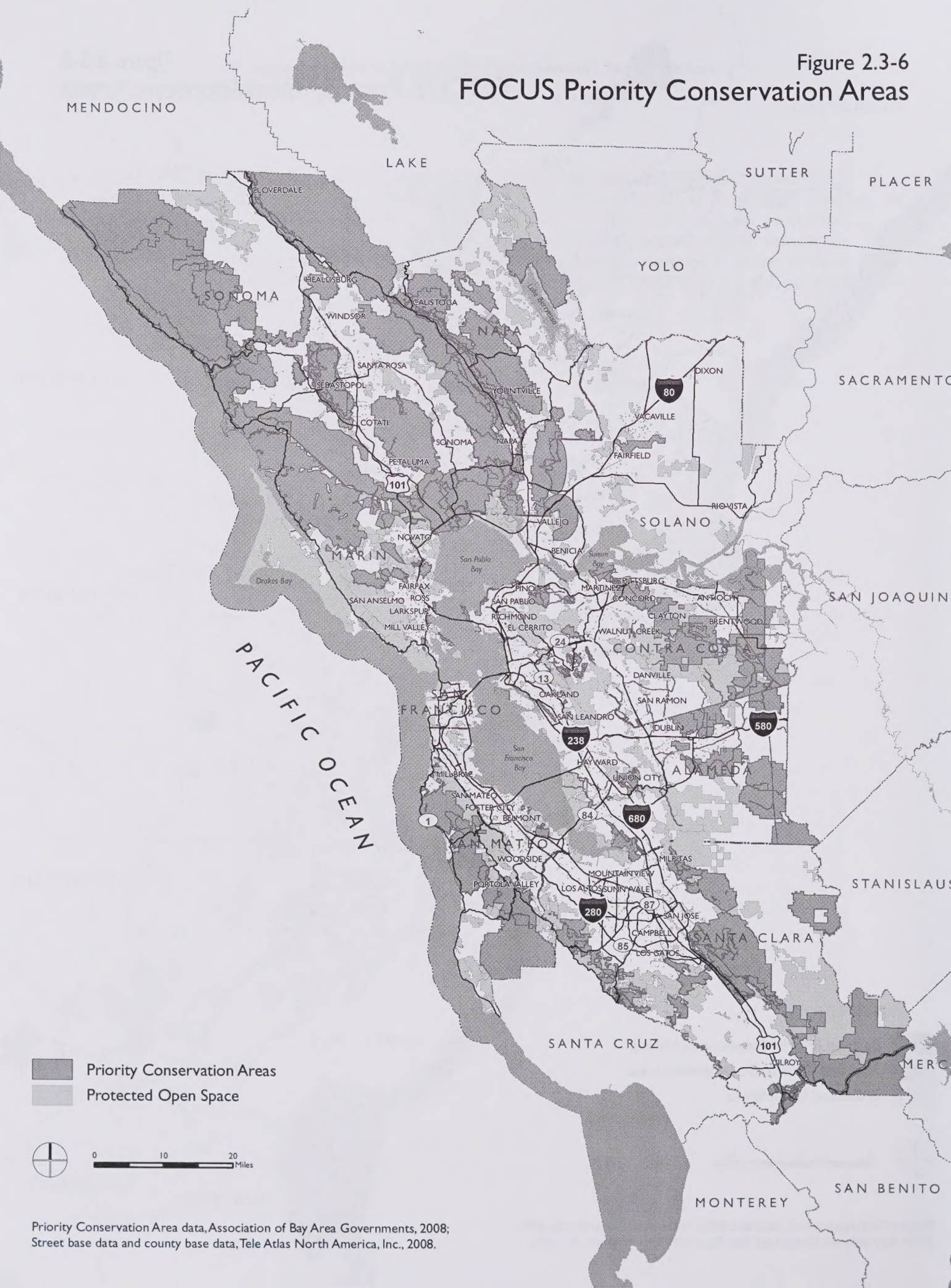
ABAG, along with the Bay Area Air Quality Management District, the Bay Conservation and Development Commission, and MTC, initiated an incentive-based strategy called FOCUS in 2007. While FOCUS is not part of the regional regulatory framework, it is important to reference here because it represents a significant step forward in integrating land use and transportation policies and investments. The primary mission of FOCUS is to work with local and regional entities to encourage more housing adjacent to transit in existing communities and to conserve regionally significant resource areas. FOCUS, which includes the identification of Priority Development Areas (PDAs) and Priority Conservation Areas (PCAs), is supported in part by a Regional Blueprint Planning Grant from the State of California. Local governments volunteer to designate areas of their communities as PDAs. Designated PDAs are then eligible for capital infrastructure

funds, planning grants, and technical assistance to support housing and transit-oriented developments. In addition, the purpose of identifying PCAs as part of FOCUS is to highlight near-term opportunities for land conservation in the Bay Area that have consensus for protection. Highlighting these areas as part of a regional planning program is intended to help inform the distribution of public funds and leverage private funds and new partnerships to invest in these areas. Figure 2.3-5 depicts the FOCUS Priority Development Areas, and Figure 2.3-6 depicts the FOCUS Priority Conservation Areas.

Figure 2.3-5
FOCUS Priority Development Areas



Figure 2.3-6
FOCUS Priority Conservation Areas



Local Agency Formation Commissions

Under State law, each county must have a local agency formation commission (LAFCO), which is the agency that has the responsibility to create orderly local government boundaries, with the goals of encouraging the orderly formation of local governmental agencies and the preservation of open space lands, and discouraging urban sprawl (California Association of Local Agency Formation Commissions website). While LAFCOs have no direct land use power, their actions determine which local government will be responsible for planning new areas. LAFCOs address a wide range of boundary actions, including creation of spheres of influences for cities, adjustments to boundaries of special districts, annexations, incorporations, detachments of areas from cities, and dissolutions of cities.

Metropolitan Transportation Commission's TOD Policy

MTC adopted a TOD Policy in 2005 to support the development of communities around new transit lines and stations identified as part of the Resolution 3434 Regional Transit Expansion Program. The regional policy is designed to address multiple goals: improving the cost effectiveness of regional investments in new transit expansions, easing the Bay Area's chronic housing shortage, creating vibrant new communities, and helping preserve regional open space. The TOD Policy establishes corridor-level thresholds to quantify appropriate minimum levels of development around transit stations along new corridors. MTC requires that local jurisdictions with a project seeking funding through Resolution 3434 must adopt a Station Area Plan that demonstrates how the jurisdiction plans to meet the housing threshold. In essence, the discretionary funding available for Resolution 3434 transit expansion projects is conditioned on a local demonstration that plans are in place and will be implemented to support adequate housing densities around those transit stations and corridors.

Local Control Mechanisms

General Plans

The most comprehensive land use planning for the San Francisco Bay Area region is provided by city and county general plans, which local governments are required by State law to prepare as a guide for future development. The general plan contains goals and policies concerning topics that are mandated by State law or which the jurisdiction has chosen to include. Required topics are: land use, circulation, housing, conservation, open space, noise, and safety. Other topics that local governments frequently choose to address are: public facilities, parks and recreation, community design, and/or growth management. City and county general plans must be consistent with each other. County general plans must cover areas not included by city general plans (i.e., unincorporated areas).

Specific and Master Plans

A city or county may also provide land use planning by developing community or specific plans for smaller, more specific areas within their jurisdiction. These more localized plans provide for focused guidance for developing a specific area, with development standards tailored to the area, as well as systematic implementation of the general plan.

Zoning

The city or county zoning code is the set of detailed requirements that implement the general plan policies at the level of the individual parcel. The zoning code presents standards for different uses and identifies which uses are allowed in the various zoning districts of the jurisdiction. Since 1971, State law has required the city or county zoning code to be consistent with the jurisdiction's general plan.

Growth Control

Local growth control endeavors to manage community growth by various methods, including tying development to infrastructure capacity or traffic level of service standards, limiting the number of new housing units, setting limits on the increase of commercial square footage, linking development to a jobs-housing balance, and the adoption of urban growth boundaries. These goals and others can be achieved through the adoption of a countywide Growth Management Program (GMP). Growth Management programs, including urban growth boundaries, have been implemented by county government and/or cities in all of the nine Bay Area counties.

Public Ownership, Purchase of Development Rights, and Open Space Acquisition

Local governments and special districts, either on their own or working with land trusts and conservancies, can acquire fee title to agricultural and open space lands or purchase development rights to preserve rural and agricultural areas, watersheds, or critical habitat, or to create public parks and recreational areas. Such actions have been undertaken in all Bay Area counties and have had significant effects on the shape of cities and urban form in the region.

IMPACT ANALYSIS

The land use impact analysis assesses the potential for significant adverse impacts related to conversion or loss of important agricultural lands and open space; community displacement and disruptions, including potential loss of housing and businesses and separation of people from community resources; and project consistency with adopted land use plans.

SIGNIFICANCE CRITERIA

Implementation of the Transportation 2035 Plan would have a potentially significant adverse impact if Plan projects would:

- Criterion 1:** Convert substantial amounts of important agricultural lands and open space (Prime Farmland, Unique Farmland, or Farmland of Statewide Importance) to non-agricultural use. Such conversion from agricultural use would be significant whether or not the proposed facility is consistent with local or regional plans.
- Criterion 2:** Conflict substantially with the land use portion of adopted local general plans or other applicable land use plans, including specific plans, existing zoning, or Williamson Act contracts. A potentially significant impact would also be identified if transportation projects would substantially influence future land use patterns and development contrary to adopted plans.

Criterion 3: Result in residential or business disruption or displacement of substantial numbers of existing population and housing.

Criterion 4: Result in permanent alterations to the characteristics and qualities of an existing neighborhood or community by separating residences from community facilities and services, restricting access to commercial or residential areas, or eliminating community amenities.

METHOD OF ANALYSIS

The land use analysis starts by narrowing down the list of projects to those that have the potential for physical impacts based on characteristics such as expansion, widening, new construction or new configurations (about 141 projects in all). Next, the analysis quantifies impacts by county to provide an understanding of: 1) the general amount and type of land that might be impacted; and 2) where impacts may be concentrated. Because there are no details about right-of-way requirements for the various investments, the analysis necessarily makes general assumptions about the amount of land needed to implement the proposed Transportation 2035 Plan (specific assumptions are cited in footnotes in the detailed analysis). As a result, the analysis presents a worst-case scenario of land use impacts, and the acreages in the analysis should be used as a guide in assessing relative impacts, rather than as absolute statements of impacts. Site-specific analysis will be required when individual projects are considered for approval.

Farmlands

The farmland analysis determines to what extent the Transportation 2035 Plan may affect the relative ability of local jurisdictions to protect agriculture and open space. To conduct the farmland analysis, 137 of the 557 projects in the proposed Transportation 2035 Plan were identified as projects with potential physical impacts on farmland, based on general characteristics such as widening, construction, and new roadway configurations, as well as the overlap of these projects with mapped farmland. The 137 projects were then studied using Geographic Information Systems (GIS) and compared with the farmland maps referenced in the Environmental Setting to determine the extent of the physical impacts of the proposed Transportation 2035 Plan projects on important agricultural lands.

Land Use Disruptions/Displacement

The impact analysis includes investigation of potential short term direct impacts due to construction, physical disruptions of existing neighborhoods, including displacement of residents and businesses, as a result of implementation of proposed transportation improvements. The analysis is presented by county and involves assumptions based on limited available information, since in most cases, the transportation projects are in the early planning phases. The assessment identifies Transportation 2035 Plan projects that may involve major right-of-way acquisition or construction activity that could disrupt traffic patterns and neighborhood navigability. The projects with potential physical impacts were studied using Geographic Information Systems (GIS) and compared with year 2005 ABAG land use maps (which included protected open space) to ascertain whether land uses such as residential, employment, or urban open space would be displaced or disrupted.

Additionally, the EIR analyzes the potential for long term community disruption by reviewing the location of Transportation 2035 Plan projects in relation to surrounding land uses and com-

munity development. New road or highway projects, extension projects and major interchange projects are assumed to have a higher potential to divide existing communities, while widening and other projects along established transportation rights-of-way are assumed to have a lower potential to divide existing communities or neighborhoods in the long-term.

Consistency with Land Use Plans

The land use analysis identifies potential conflicts or inconsistencies between the proposed Transportation 2035 Plan and adopted land use policies of the various jurisdictions within the study area. The analysis also identifies Transportation 2035 projects that intersect with airport planning areas.

SUMMARY OF IMPACTS

Direct Impacts

Implementation of the Transportation 2035 Plan projects could result in loss of agricultural land, short-term disruptions including congestion and residential and business displacements, and long term community land use impacts as a result of the construction of highway and transit projects proposed in the Plan.

Conversion of Farmland

Overall, there are 142 projects in the proposed Transportation 2035 Plan in eight counties with the potential to impact 1,397 acres of farmland, assuming the worst case disturbance. Only 21 percent of this land is Prime Farmland.

Land Use and Community Disruption/Displacement

There are 149 projects in the proposed Transportation 2035 Plan with the potential to impact 2,154 acres of existing land uses within built communities. These projects could cause short term community disruption in locations where transportation improvements involve significant construction activity. The duration of impact on adjacent and nearby land uses could vary from several months to several years.

Some of these same projects could also result in significant and permanent disruption of existing communities; however, the potential for such disruption is minimized because large freeway, expressway and rail transit projects in the Plan typically involve widening or other capacity increases along existing transportation corridors; they would not split or bisect established communities that share historical links. However, some potential for community disruption remains with widening projects, particularly those that add new travel lanes, which may significantly and permanently change pedestrian and bicycle movement across or along the roadway, as compared to existing conditions. In some cases, the widening project may actually improve pedestrian and bicycle movement because sidewalks or bike lanes may be incorporated into the project scope.

Consistency with Local Plans

The proposed transportation improvements in the Transportation 2035 Plan effectively do not conflict with the land use designations of current local general plans.

Other Direct Impacts

The implementation of some transportation improvements in the proposed Transportation 2035 Plan could adversely affect adjoining land. Impacts could include increased noise, disturbance of cultural resources, and loss or modifications to significant natural habitats. While these impacts can affect the compatibility of the proposed transportation improvements with adjoining uses, these impacts are more logically addressed in the related chapters of *Part Two* of this EIR.

Indirect/Cumulative Impacts

Concurrent implementation of the proposed Transportation 2035 Plan and forecasted development of residential and employment land uses would result in the conversion of substantial amounts of Prime and Important farmlands to urban use in the Bay Area.

IMPACTS AND MITIGATION MEASURES

Impact

2.3-1 Implementation of the proposed Transportation 2035 Plan could convert farmland, including prime agricultural land designated by the State of California, to transportation use. (*Significant, unavoidable*)

Land converted from Prime or Important farmland to transportation use can have direct effects in as much as productive land can no longer produce crops, but it may also have indirect effects to the extent that conversion creates fragmentation of agricultural land, adjacent use conflicts, hinders existing transportation access, or restricts infrastructure options that are necessary to the function of the agricultural property.

Overall, there are 142 projects in the proposed Transportation 2035 Plan in eight counties with the potential to impact 1,397 acres of farmland, assuming the worst-case disturbance.¹⁴ Of that farmland, the majority or 57 percent is Grazing Land, 21 percent is Prime Farmland, and the remaining quarter is made up of Farmland of Local and Statewide Importance and Unique Farmland, as documented in Table 2.3-9.¹⁵ Of those 142 projects, most (58) are road widening projects, 31 are projects on interchanges or intersections, 15 are new roads, and the remaining are extensions or other types of physical improvement projects, like parking lots or transit terminals, as illustrated in Table 2.3-10. Though it is particularly difficult to project the potential impact of intersection improvements on farmland acres, the projects included in this analysis generally represent intersection improvements that result in new roadway configurations and thus may have different edge conditions than the existing intersections. The buffer used to quantify potential impact of intersection improvements is necessarily general—a 100 foot radius—and likely to be a “worst case” estimate of disturbance.

¹⁴ The acreage calculation is based on a 100 foot buffer on either side of the centerline of a linear project and a 100 foot radius around the center of a point project, such as an intersection improvement resulting in a new configuration. Existing roadway is categorized as “roadway” and thus not counted in farmland impact totals.

¹⁵ The farmland acre totals include land not currently in production. In some cases, these farmlands may be zoned for urban development.

Table 2.3-9: Types of Farmland Potentially Affected by Proposed Plan

Type	Acres	Percent
Prime Farmland	290	21%
Farmland of Statewide Importance	44	3%
Farmland of Local Importance	237	17%
Grazing Land	800	57%
Unique Farmland	24	2%
Total	1,397	100%

Source: Metropolitan Transportation Commission; Dyett & Bhatia, 2008

Table 2.3-10: Types of Projects Potentially Affecting Agricultural Lands

County	Type of Project in Plan					Total
	Extension	Intersection	New	Widening	Other	
Alameda	1	9	3	9	6	28
Contra Costa	3	7	4	13	5	32
Marin		2	1		2	5
Napa	1			1		2
San Mateo	2	4	2	8	2	18
Santa Clara	6	6	4	17	4	37
Solano		1	1	6	2	10
Sonoma	1	2		3		6
Regional/Multiple Counties ^a				1	3	4
Total	14	31	15	58	24	142

^a This category includes projects such as BART, SMART, and other transit projects of a regional scale.

Source: Metropolitan Transportation Commission; Dyett & Bhatia, 2008

The types and amounts of farmland potentially affected by Transportation 2035 Plan projects are shown in Table 2.3-11. Alameda and Solano counties are the most impacted, with 364 and 360 acres of potentially threatened farmland, respectively. In Alameda County, the majority (346 acres) of the impacted acres are grazing land. In Solano, 199 acres of grazing land and 155 acres of prime farmland is affected. San Mateo and Marin counties have the least amount of affected land, with only 29 and 81 acres of concern, respectively.

Table 2.3-11: Farmland Acres Potentially Affected by Proposed Plan, by County and Type

	<i>Farmland of Local Importance</i>	<i>Farmland of Statewide Importance</i>	<i>Grazing Land</i>	<i>Prime Farmland</i>	<i>Unique Farmland</i>	<i>Total</i>
Alameda		0	346	15	3	364
Contra Costa	40	21	81	18	0	160
Marin	69		12			81
Napa	12		27			39
San Mateo	1		10	7	11	29
Santa Clara	4	10	103	62	5	184
Solano		3	199	155	2	360
Sonoma	68	9	21	27	3	128
Total	194	44	800	284	24	1,346

Source: Metropolitan Transportation Commission; Dyett & Bhatia, 2008

With the exception of San Francisco¹⁶ and Solano counties, all other counties in the Bay Area are protected by one or more County-wide land use measures such as urban service areas, environmental corridors, slope/density restrictions, stream conservation areas, or riparian buffers. Additionally, some of the cities have Urban Growth Boundaries (UGB) to limit sprawl and protect agricultural land. Generally, this means that if a project falls outside a UGB, there are regulatory measures in place to aid local jurisdictions in farmland protection. According to Greenbelt Alliance, of the 101 Bay Area cities studied in their 2006 Smart Growth Scorecard, 28 have UGBs as of September 2008. Counties and cities with measures protecting open space are summarized in Table 2.3-12.

¹⁶ San Francisco County does not have agricultural land.

Table 2.3-12: Bay Area Urban Growth Boundaries and County-wide Land Use Measures

<i>County</i>	<i>County-wide Measure</i>	<i>Cities with an Urban Growth Boundary</i>
Alameda	Yes	Dublin, Hayward, Livermore, Pleasanton
Contra Costa	Yes	Antioch, San Ramon
Marin	Yes	Novato
Napa	Yes	Napa, St Helena, Yountville
San Francisco ^a	No	
San Mateo	Yes	Half Moon Bay
Santa Clara	Yes	Cupertino, Gilroy, Milpitas, Monte Sereno, Morgan Hill, San Jose
Solano	No	Benicia, Fairfield, Vacaville
Sonoma	Yes	Cotati, Healdsburg, Petaluma, Rohnert Park, Santa Rosa, Sebastopol, Sonoma, Windsor

^a San Francisco County has no affected farmland acres.

Source: Association of Bay Area Governments, 2006; Greenbelt Alliance, 2008

The likelihood of farmland conversion increases where transportation improvements are located at the edges of existing urban areas, along waterways, or over hills separating urban areas. The extent of this impact will depend on the final design of the identified projects and on the project-specific analysis required by CEQA to determine the importance of the endangered resource land. However, given the predominant location of projects within developed areas and existing corridors, the conversion of agricultural resource land is likely to be limited. Many municipalities have already planned for the conversion of some open space to urban uses, usually where the land is for grazing (which is not an endangered agricultural activity) rather than agricultural production. However, some conversion could be significant, depending on the amount and type of farmland that is converted.

Mitigation Measures

2.3(a) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce impacts on farmlands that shall be considered by project sponsors and decision-makers may include, but are not limited to, those described below.

- Corridor realignment, where feasible, to avoid farmland, especially Prime Farmland;
- Conservation easements on land at least equal in quality and size as partial compensation for the direct loss of agricultural land;
- Abiding by the proper notification provisions of the Williamson Act when it appears that land enrolled in a Williamson Act contract may be required for a public use, is acquired, the original transportation improvement for the acquisition is changed, or the land acquired is not used for the improvement;

- If a Williamson Act contract is terminated, the Department of Conservation recommends a ratio greater than 1:1 of land equal in quality be set aside in a conservation easement;
- Instituting new protection of farmland in the project area or elsewhere in the County through the use of less than permanent long-term restrictions on use, such as 20-year Farmland Security Zone contracts (Government Code Section 51296 et seq.) or 10-year Williamson Act contracts (Government Code Section 51200 et seq.);
- Mitigation fees that support the commercial viability of the remaining agricultural land in the project area, County, or region through a mitigation bank that invests in agricultural infrastructure, water supplies, marketing, etc;
- Minimize severance of agricultural land by constructing underpasses and overpasses at reasonable intervals to provide property access;
- Agricultural enhancement investments such as supporting farmer education on organic and sustainable practices, assisting with organic soil amendments for improved production, and upgrading irrigation systems for water conservation;
- Berms, buffer zones, setbacks, and fencing to reduce use conflicts between transportation facilities and farming uses and to protect the functions of farmland; and
- Other conservation tools available from the California Department of Conservation's Division of Land Resource Protection.

Because it is not known to what extent Prime and Important farmlands can be avoided, implementation of this mitigation measure is expected to reduce potentially significant farmland impacts, but not to a less-than-significant level in all cases.

Impact

2.3-2 Implementation of the proposed Transportation 2035 Plan could disrupt or displace existing land uses, neighborhoods, and communities in the short term. (*Significant, unavoidable*)

The proposed transportation improvements in the Transportation 2035 Plan could result in short term community disruption where such improvements involve significant construction activity. Transportation projects will undergo construction at different times throughout the 25-year life of the Plan. The significance of the disruption will depend upon the size and extent of the improvement, the nature of the disruption, and the duration of construction. While construction activities are typically limited in duration, work on major transportation improvements such as rail transit extensions, freeway widening projects and major interchange reconstructions, often span a period of several years because the projects are large and complex and/or because the construction contractors are required to keep traffic flowing on existing lanes passing through the construction sites. As a result, the construction of major transportation improvements can result in frequent inconveniences (e.g., blocked or limited access, detours, or delays) and irritations for residents of communities immediately adjacent to the construction sites during the construction period.

There are 149 projects in the proposed Transportation 2035 Plan in nine counties with the potential to impact 2,154 acres of existing land uses, assuming the worst-case disturbance.¹⁷ Of that total, 43 percent is employment related land use (e.g. commercial and industrial), another 33 percent is residential, and the remaining 25 percent is urban open space, as documented in Table 2.3-13. Of those 149 projects, most (59) are widening projects, 31 are related to intersection or interchanges, 15 are new roads, and the remaining are extensions or other types of physical improvement projects, like combination projects, that do not fit into any category, as illustrated in Table 2.3-14. These projects could cause temporary disruptions of homes, businesses, and urban open space.

Table 2.3-13: Generalized Urban Land Uses Potentially Disrupted by Proposed Plan

Land Use	Acres	Percent
Employment Areas	920	43%
Residential	701	33%
Urban Open Space	533	25%
Total	2,154	100%

Source: Metropolitan Transportation Commission; Dyett & Bhatia, 2008

Table 2.3-14: Types of Projects Potentially Disrupting Existing Land Use

County	Type of Project in Plan					Total
	Extension	Intersection	New	Widening	Other	
Alameda	1	9	3	9	6	28
Contra Costa	3	7	4	13	5	32
Marin		2	1		2	5
Napa	1			1		2
San Francisco				1	6	7
San Mateo	2	4	2	8	2	18
Santa Clara	6	6	4	17	4	37
Solano		1	1	6	2	10
Sonoma	1	2		3		6
Regional/Multiple Counties ^a				1	3	4
Total	14	31	15	59	30	149

^a This category includes projects such as BART, and other transit projects of a regional scale.

Source: Metropolitan Transportation Commission; Dyett & Bhatia, 2008

¹⁷ The acreage calculation is based on a 100 foot buffer on either side of the centerline of a linear project and a 100 foot radius around the center of a point project, such as an intersection improvement resulting in a new configuration. Existing roadway is categorized as "roadway" and thus not counted in impact totals.

The counties containing existing land uses potentially affected by Transportation 2035 Plan projects are shown in Table 2.3-15. Solano County has the most amount of impacted land use, totaling 409 acres. The potential disruption occurs mostly in its employment areas, but there is also a substantial amount of disruption in residential and open space areas. Santa Clara County has the second largest urban land use impact, totaling 372 acres; this is followed by Alameda County with 357 acres. Napa County has the least amount of impacted land use at 23 acres. Overall, implementation of the proposed Transportation 2035 Plan has the potential to affect more employment land than residential areas or urban open space.

Table 2.3-15: Existing Land Use Acres by County Potentially Affected by Proposed Plan

County	Land Use			Total
	Employment Areas	Residential	Urban Open Space	
Alameda	75	128	155	357
Contra Costa	138	82	64	285
Marin	36	4	4	43
Napa	9	1	13	23
San Francisco	79	30	57	166
San Mateo	75	47	19	141
Santa Clara	199	129	44	372
Solano	178	101	130	409
Sonoma	131	181	47	359
Total	920	701	533	2,154

Source: Metropolitan Transportation Commission; Dyett & Bhatia, 2008

Mitigation Measures

2.3(b) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce short-term (often construction-related) disruption or displacement of existing land uses, specifically residential, commercial, or urban open space impacts that shall be considered by project sponsors and decision-makers may include, but are not limited to, those described below.

- Berms and fencing to reduce conflicts between transportation facilities and existing uses.
- Regulate construction operations on existing facilities to minimize traffic disruptions and detours, and to maintain safe traffic operations.
- Ensure construction operations are limited to regular business hours where feasible.
- Control construction dust and noise.
- Control erosion and sediment transport in stormwater runoff from construction sites.

Additional applicable mitigation measures are listed under the short-term construction-related impact in *Chapter 2.2: Air Quality*, and are included here by reference. The extent of this impact will depend on the final design of each transportation improvement and the phasing of implementation. Implementation of this mitigation measure is expected to reduce potentially significant impacts related to short-term community disruption, but not to a less-than-significant level in all cases.

Impact

2.3-3 Transportation improvements in the proposed Transportation 2035 Plan have the potential to cause long-term community disruption. (*Significant, mitigable*)

Local governments have initiated projects in the proposed Transportation 2035 Plan with the intention of enhancing the quality of life in existing communities and neighborhoods. Examples include constructing rail extensions in San Francisco, Oakland, and Silicon Valley, operating Rapid Bus Transit along major corridors, and implementing transit accessibility, traffic calming, and bicycle and pedestrian improvement projects in many communities, throughout the region. Planning projects in urban areas and reusing urban sites or facilities support focused growth and transit-oriented development initiatives (such as improving station access or expanding the capacity of current BART stations), is expected to involve the redevelopment of existing urban sites with higher density development.

All of these urban transportation projects have the potential to change the character of existing communities; however, the potential for permanent community disruption caused by the Transportation 2035 Plan is minimal for the following reasons:

- 1) Historically, transportation improvements with the highest risk of community disruption include *new* freeways, expressways, or rail lines on alignments that pass through existing urban areas and pockets of development in rural areas. Few, if any, of the specific projects in the proposed Transportation 2035 Plan fit this historical mold. The large freeway, expressway and rail transit projects in the Plan all involve widening or other capacity increases along existing transportation corridors; they would not split or bisect established communities that share historical links.
- 2) Some projects in the proposed Transportation 2035 Plan would actually expand interconnections between neighborhoods and communities that are currently separated by major transportation corridors. Examples include bridges or undercrossings (with bike lanes) of commuter rail lines, bicycle/pedestrian overcrossings of freeways, and urban trail and pathway projects.

In some cases, however, highway widening projects may convert stretches of fairly narrow local road to much larger roadway with diminished pedestrian accessibility and visibility from one side to the other, such as a stretch of roadway expanded from 2 lanes to 6 lanes. In these cases, there remains some potential for long term community disruption caused by projects within the proposed Transportation 2035 Plan.

Mitigation Measures

2.3(c) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall

consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce long-term disruption of displacement of existing communities that shall be considered by project sponsors and decision-makers may include, but are not limited to, those described below.

- Berms and fencing to reduce conflicts between transportation facilities and existing uses;
- Pedestrian and bike connectors across widened sections of roadway;
- Sidewalk, signal, and signage treatments to improve the pedestrian connectivity across widened sections of roadway;
- Corridor realignment, where feasible, to avoid land use disruption; and
- Buffer zones and setbacks to protect the continuity of land uses.

2.3(d) Through regional programs such as the Transportation for Livable Communities Program, Regional Bicycle Program, etc., MTC shall continue to support locally sponsored traffic calming and alternative transportation initiatives, such as paths, trails, overcrossings, bicycle plans, and the like that foster improved neighborhoods and community connections.

Implementation of these mitigation measures, combined with affirmative efforts to foster local-scale alternative transportation initiatives, is expected to reduce potentially significant community disruption to a level that is less than significant.

Impact

2.3-4 Implementation of the proposed Transportation 2035 Plan may conflict with existing local plans. (*Less than Significant*)

The interagency screening and evaluation process for all locally-sponsored transportation improvements is built upon a foundation of local general plans. The proposed transportation improvements in the Transportation 2035 Plan originate from Project Study Reports (PSR) or transportation corridor studies prepared by Caltrans, the Congestion Management Programs of each county, the Countywide Transportation Plans for a number of counties, and the service plans for a number of transit agencies. These plans and programs have been developed to consider the current needs and future demands identified in local general plans and supporting studies, including local traffic management plans, capital improvement programs (CIPs), transit-supportive development plans, streetscape and pedestrian improvements, and bicycle plans.

While transportation improvements on State and Interstate highways and those sponsored by special districts – such as BART, AC Transit, SamTrans, Golden Gate Transportation District, etc. – are not necessarily derived from local general plans, they are reviewed for consistency with such plans through the congestion management program update process, countywide transportation plan process, and environmental review processes lead by project sponsors. As a result, the proposed transportation improvements in the proposed Transportation 2035 Plan effectively do not conflict with the land use designations of current local general plans.

Projects that fall within Airport Land Use Plans (ALUPs) must comply with these compatibility plans before they are implemented. The entities responsible for establishing the guidelines are Airport Land Use Commissions (ALUCs). State law defines the powers and duties of ALUCs broadly “to assist local agencies in ensuring compatible land uses in the vicinity of all new airports and in the vicinity of existing airports to the extent that the land in the vicinity of those airports is not already devoted to incompatible uses” (Section 21674(a)), and one of the major tools ALUCs have to achieve this goal is to prepare Compatibility Plans: “Each commission is required to “prepare and adopt” an airport land use plan for each of the airports within its jurisdiction (Sections 21674(c) and 21675(a)).

Table 2.3-16 shows the 17 Transportation 2035 Plan projects with potential for physical impacts that also fall within a two-mile radius of the Oakland, San Francisco, or San Jose airports. As all local and county general plans and projects must also be compatible with ALUPs, and RTPs must be compatible with local plans, there are a number of cross-cutting regulatory pressures to ensure that these Transportation 2035 Plan projects do not conflict with airport land uses.

Table 2.3-16: Projects that Intersect with Airport Planning Areas

<i>Project ID</i>	<i>Airport</i>	<i>County</i>	<i>Type of Investment*</i>	<i>Description</i>
21602	SFO	San Mateo	N	Reconstruct U.S. 101/Broadway interchange
22084	OAK	Alameda	N	Improve connection to the Oakland International Airport's North Field, connecting Route 61 (Doolittle Drive) with Earhart Road and extend the infield area at North Field
22179	SJC	Santa Clara	N	Widen Central Expressway from 4 to 6 lanes between Lawrence Expressway and San Tomas Expressway
22186	SJC	Santa Clara	N	Widen San Tomas Expressway to 8 lanes between El Camino Real (Route 82) and Williams Road
22230	SFO	San Mateo	N	Construct auxiliary lanes (one in each direction) on I-280 from I-380 to Hickey Boulevard
22676	OAK	Regional/Multiple Counties	N	Improve passenger capacity at 43 BART stations
230170	OAK	Alameda	N	Improve access to I-880 from 42nd and High Street
230200	SJC	Santa Clara	N	Improve local circulation on St. John Street and Autumn Street
230201	SJC	Santa Clara	N	Widen Coleman Avenue from 4 to 6 lanes from I-880 to Taylor Street
230210	SJC	Santa Clara	N	Rebuild box culvert under San Tomas Expressway
230262	SJC	Santa Clara	N	Construct and new interchange at U.S. 101 and Montague Expressway
230267	SJC	Santa Clara	C	Widen and add HOV lanes on Montague Expressway between Lick Mill and Trade Zone Boulevards and on Guadalupe River Bridge and Penitencia Creek Bridge

Table 2.3-16: Projects that Intersect with Airport Planning Areas

Project ID	Airport	County	Type of Investment*	Description
230269	SJC	Santa Clara	C	Construct a new interchange at Trimble Road and Montague Expressway
230449	SJC	Santa Clara	N	Extend Charcot Avenue over I-880 as a new two-lane roadway
230456	SJC	Santa Clara	C	Widen Zanker Road from 4 to 6 lanes
230458	SJC	Santa Clara	N	Widen Berryessa Road from U.S. 101 to I-680
230664	SFO	San Mateo	N	U.S. 101 in San Mateo County from Whipple Avenue to Millbrae – widen for new HOT lane

*C: Committed; N: New Commitment

Source: Metropolitan Transportation Commission; Dyett & Bhatia, 2008

ABAG's *Projections 2007* was developed based on local input, reviewing of local General Plans and parcel data from county assessors' records. These forecasts may not be entirely consistent with future city policies because *Projections 2007* relies on proactive economic assumptions about land use policies based on smart growth principles. ABAG's policy-based projections specifically forecast more growth in existing communities and near transit, while directing growth away from agricultural areas and open space. Choosing to include a factor that directs growth to areas with public transit would reinforce the importance of encouraging growth in areas with a variety of transportation options. In other words, its forecasts start out and end with a regional growth perspective which may not be consistent with what actually occurs in local jurisdictions whose goals are city-centric.

Cumulative Impact

2.3-5 Concurrent implementation of the proposed Transportation 2035 Plan and forecast development would result in cumulatively considerable conversion of Prime and Important farmlands to urban use throughout the Bay Area. (*Significant Cumulative Impact, Contribution Cumulatively Considerable*)

ABAG's *Projections 2007* anticipate that over the next 25 years, about 2 million new residents and 1.8 million new jobs will be added in the nine-county region. This growth will require the conversion or redevelopment of considerable land in the region to accommodate new jobs and housing. ABAG also projects that about 90,000 acres of open space will be converted to urban use to accommodate this planned growth. This development represents conversion of approximately two percent of the land in the Bay Area to urban uses over the next 25 years, as related in Table 2.3-3.

While not all of the open space converted to urban use will be Prime or Important farmland, the challenge of protecting Prime and Important farmland against encroachment is great, as evidenced by the change in Bay Area agricultural lands over time, reported in Table 2.3-5. Overall, population and development pressure has been stronger than agricultural land preservation practices in the Bay Area in the recent past, and is likely to remain stronger in the near future. There are UGBs and county-wide land use measures in place throughout the Bay Area to protect open

space from conversion to urban use. However, there are still many communities without growth limits in place, and those that do exist vary in quality, effectiveness, and enforcement. Thus, to some extent, this conversion process is likely to be both irreversible and cumulatively significant.

The conversion of farmland to transportation use will contribute somewhat to this significant cumulative impact. In part because the impact is likely to be irreversible, and in part because State and local regulatory agencies already struggle to maintain the resource, even the relatively small (in probable acreage) impact of Plan projects may be considered a cumulatively considerable contribution.

MTC has no land use authority and cannot directly affect the pattern of future land uses. However, in addition to mitigation measures 2.3(a) through 2.3(d), it can strive to implement the following measure to reduce transportation impacts on Prime and Important farmland.

Mitigation Measures

2.3(e) MTC shall continue to participate in and promote the efforts of the multi-agency FOCUS project, which is intended to coordinate regional growth efforts to use land more efficiently, optimize transportation and other infrastructure investments in existing communities that focus new development near existing transit, preserve open space, etc. In this way, MTC, in partnership with regional agencies such as ABAG, and advocacy groups such as Greenbelt Alliance and TransForm (formerly TALC), can pursue the enhanced coordination of local land use planning with transportation investments in the proposed Transportation 2035 Plan.

Because of MTC's lack of a direct role in land use planning, this measure is not expected to reduce this overall cumulative impact to a less-than-significant level, and the Project's contribution remains cumulatively considerable.

2.4 Energy

Transportation energy use is related to the efficiency of cars, trucks and public transportation; choice of different travel modes (auto, carpool, and public transit); and miles traveled by these modes. Energy is also consumed with construction and routine operation and maintenance of the transportation infrastructure.

This chapter discusses the energy impacts of implementing transportation improvements in the proposed Transportation 2035 Plan, including issues related to consumption of non-renewable energy sources for construction of transportation projects, and the operation of private and commercial transportation. For an analysis of greenhouse gas production and project impacts on climate change, please see *Chapter 2.5: Greenhouse Gases and Climate Change*.

ENVIRONMENTAL SETTING

PHYSICAL SETTING

Energy Types and Sources

Total energy consumption in the U.S. in 2005 was approximately 100.7 quadrillion (10^{15}) British thermal units (Btu), which represents about 22 percent of the world's energy consumption. Petroleum provides approximately 40 percent of the energy used in the U.S.¹ Coal and natural gas each provide approximately 23 percent, and nuclear and renewable sources supply the rest in roughly equal proportions.

Petroleum and natural gas supply most of the energy consumed in California. Petroleum products provide approximately 46 percent of the state's energy, and natural gas provides approximately 29 percent. The remaining 25 percent of state energy demand is met by a variety of energy resources, including coal, nuclear, geothermal, wind, solar, and hydropower.²

The energy consumed by the transportation sector accounts for roughly 41 percent of California's petroleum demand and 38 percent of its greenhouse gas emissions. The transportation sector, including on-road and rail transportation, consumes roughly 16 billion gallons of gasoline and 4 billion gallons of diesel fuel each year. California is the third largest consumer of gasoline in the world, behind the U.S. (as a whole) and China.³

¹ Energy Information Administration Annual Energy Review, 2007 U.S. Primary Energy Consumption by Source and Sector, available at http://www.eia.doe.gov/emeu/aer/pecss_diagram.html.

² California Energy Commission, Integrated Energy Policy Report, 2007.

³ Ibid.

Petroleum

Most gasoline and diesel fuel sold in California for motor vehicles is refined in California to meet state-specific formulations required by the California Environmental Protection Agency's Air Resources Board. Major petroleum refineries in California are concentrated in three counties: Contra Costa County in northern California, Kern County in central California, and Los Angeles County in southern California. Valero, Tesoro, Phillips, Shell and Chevron operate refineries in Contra Costa County.

In 2005, refineries in California processed approximately 674 million barrels (1.8 million barrels per day) of crude oil. Nearly forty percent came from in-state oil production facilities, approximately sixteen percent came from Alaska, and the remainder came from foreign sources. Together, refineries in the Los Angeles and Bay Area counties process more than 90 percent of California's crude oil input.⁴ The long-term oil supply outlook for California indicates that in-state and Alaska supplies are declining, leading to increasing dependence on foreign oil sources.

Gasoline and diesel consumption for the nine Bay Area counties, during 2005 and 2006, is shown in Table 2.4-1. Over this period, gasoline and diesel consumption in the Bay Area increased by less than one percent, with slightly lower increases in San Francisco and San Mateo counties. Caltrans estimates that 3.2 billion gallons of gasoline were consumed in the Bay Area during 2006 (excluding aviation fuel), which translates to about 8.8 million gallons each day.

Table 2.4-1: Annual Gasoline and Diesel Consumption in the San Francisco Bay Area, 2005 and 2006 (1,000 gallons)

County	2005	2006	% Change
Alameda	768,354	775,205	0.9%
Contra Costa	447,742	451,625	0.9%
Marin	150,162	151,425	0.8%
Napa	61,376	61,917	0.9%
San Francisco	168,682	170,085	0.8%
San Mateo	350,730	353,679	0.8%
Santa Clara	779,306	786,034	0.9%
Solano	255,076	257,352	0.9%
Sonoma	208,282	210,134	0.9%
Bay Area	3,189,710	3,217,456	0.9%

Source: California Department of Transportation, Division of Transportation System Information, December 2006; Environmental Science Associates, 2008

⁴ Ibid.

Natural Gas

Four regions supply California with natural gas. Three of them—the Southwestern U.S., the Rocky Mountains, and Canada—supply approximately 87 percent of all natural gas consumed in California. The remainder is produced in California. In 2006, approximately one-half of all natural gas consumed in the state was used to generate electricity. Residential consumption represented approximately one-third of California natural gas use with the balance consumed by the industrial, resource extraction, and commercial sectors.⁵

Pacific Gas & Electric (PG&E) is the primary natural gas provider for the San Francisco Bay Area. PG&E obtains its energy supplies from natural gas fields in northern California.

Electricity

Power plants in California meet approximately 78 percent of the in-state electricity demand; hydroelectric power from the Pacific Northwest provides another 7 percent and power plants in the southwestern U.S. provide another 15 percent.⁶ The contribution between in-state and out-of-state power plants depends upon, among other factors, the precipitation that occurred in the previous year and the corresponding amount of hydroelectric power that is available. In the Bay Area, Contra Costa County is home to one of the largest power plants in California: the Pittsburg Power Plant. It is the fourth largest power plant in California and consumes natural gas. Smaller power plants and cogeneration facilities are located throughout the Bay Area. PG&E is the primary electricity supplier to northern California.

Alternative Fuels

The U.S. Department of Transportation currently recognizes the following as alternative fuels: methanol and denatured ethanol (alcohol mixtures that contain no less than 70 percent of the alcohol fuel), natural gas (compressed or liquefied), liquefied petroleum gas, hydrogen, coal-derived liquid fuels, fuels derived from biological materials (i.e., biomass), and electricity. The liquid fuel referred to as Methanol (M85) consists of methanol and gasoline and is derived from natural gas, coal, or woody biomass. The liquid fuel referred to as Ethanol (E85) consists of ethanol and gasoline and is derived from corn, grains or agricultural waste. Natural gas consists of a high percentage of methane (generally above 85 percent), and varying amounts of ethane, propane, butane, and inert gases (typically nitrogen, carbon dioxide, and helium) and comes from underground reserves. Liquefied petroleum gas (LPG) consists mostly of propane and is a byproduct of petroleum refining or natural gas processing. Current technologies for electric vehicles include lead acid and nickel metal hydride batteries.

⁵ California Energy Commission, Integrated Energy Policy Report, 2007, available at <http://www.energy.ca.gov/2007publications/CEC-100-2007-008/CEC-100-2007-008-CMF.PDF>.

⁶ Ibid.

Energy Use for Transportation

Transportation is the largest energy consumer both nationwide and in the state, accounting for 28.5 percent of the total national energy use and 41 percent of total California energy use.⁷ On-road vehicles are estimated to consume approximately 80 percent of California's transportation energy demand, with cars, trucks, and buses accounting for nearly all of the on-road fuel consumption. Petroleum products (gasoline, diesel, jet fuel) account for almost 99.5 percent of the energy used by the California transportation sector with the rest provided by ethanol, natural gas and electricity.⁸

On-road vehicles use about 90 percent of the petroleum consumed in California. Caltrans estimates that in 2006 over 3.2 billion gallons of gasoline and diesel fuel were consumed in the nine Bay Area counties – an increase of about 8 million gallons over 2000 consumption levels.⁹

According to Caltrans, California can expect a 61 percent increase in gasoline consumption and a 68 percent increase in the number of vehicle miles traveled (VMT) from 2005 to 2030.¹⁰ The California Energy Commission (CEC) reported that 414.4 gallons of gasoline were used per capita in 2004 in California, compared to a national average of 464 gallons per capita.¹¹

However, owing to rising oil prices, for the first time since 1992, gasoline consumption in California has fallen since 2006 (see Figure 2.4-1).¹² For all of 2007, gasoline usage in California was 0.97 percent less compared to the previous year. Gasoline use in California was estimated at a total of 15.672 billion gallons for the twelve months of 2007 – a decline of 153 million gallons from the total of 15.825 billion gallons for the calendar year 2006. With the highest fuel prices in the nation, fuel usage has continued its downward trend so far in 2008 with lower gasoline consumption being reported for the first quarter of the year when compared to the same period last year. The average California gas price at the pump increased from \$1.88 in 2003 to \$3.12 in 2007 to \$3.61 in March 2008.

⁷ Ibid.

⁸ Bureau of Transportation Statistics, Transportation Energy Consumption by Energy Source: 2003, available at http://www.bts.gov/publications/state_transportation_statistics/state_transportation_statistics_2006/html/table_07_01.html

⁹ California Department of Transportation, California Motor Vehicle Stock, Travel, and Fuel Forecast, December 2006.

¹⁰ California Department of Transportation, California Motor Vehicle Stock, Travel, and Fuel Forecast, December 2006.

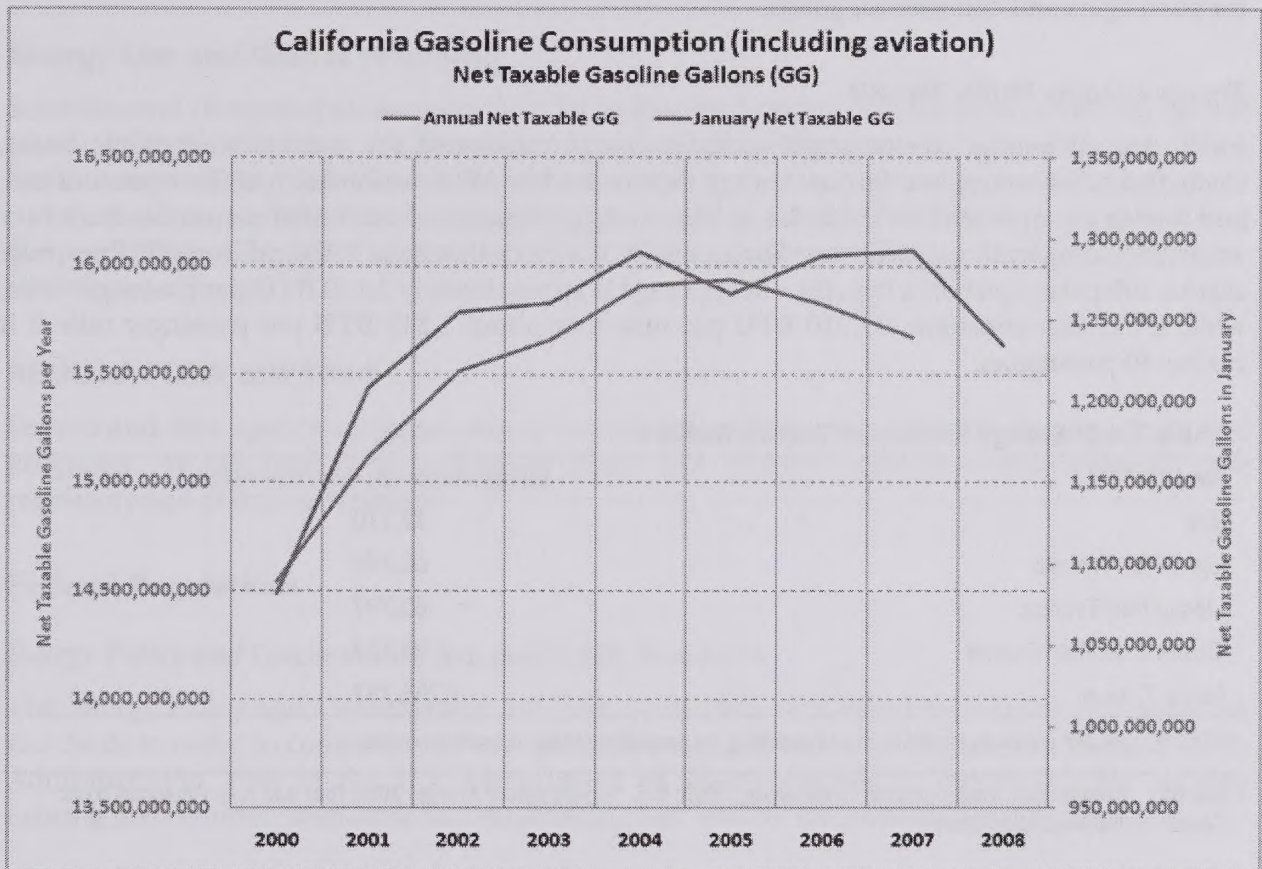
¹¹ California Energy Commission, *U.S. Gasoline Per Capita Use by State*, Accessed on 3/31/08:

http://www.energy.ca.gov/gasoline/statistics/gasoline_per_capita.html

¹² Green Car Congress, *California Gasoline Consumption Declining*, April 30, 2008, accessed on July 14, 2008 at

<http://www.greencarcongress.com/2008/04/california-gaso.html>,

Figure 2.4-1: Gasoline Consumption in California



Source: Green Car Congress, *California Gasoline Consumption Declining*, April 30, 2008, accessed on July 14, 2008 at <http://www.greencarcongress.com/2008/04/california-gaso.html>

Another consequence of the recent fuel price increase is a surge in transit ridership and reduction in VMT nationwide and in the Bay Area. Nationwide, mass transit ridership reached a 50-year high in 2007 as consumers tried to temper the impact of soaring gasoline prices. Transit ridership reached 2.6 billion during the first quarter of 2008, a 3.3 percent increase over the same period last year while VMT during the same period dropped 2.3 percent. Travel on light rail, which includes streetcars and trolleys, showed the highest increase with a 10.3 percent jump in ridership, according to American Public Transportation Association. Commuter rails came in second with a 5.7 percent increase in usage during the first quarter in large metropolitan areas. Buses had the least increase in ridership at 2 percent, although cities with populations under 100,000 saw a large increase of 7.8 percent in bus ridership. In the Bay Area, Caltrain saw a 6.37 percent increase and BART experienced a 4.5 percent increase in ridership during the same period. Factors that have contributed to the growth spurt in ridership include record-high gas prices, increasing awareness of environmental issues and, in places like San Francisco, a growing population close to transit centers.

Long-term energy consumption trends for transportation will be largely determined by fuel efficiency trends for motor vehicles, as motor vehicles are the predominant transportation mode for passengers and commercial goods.

Energy Used By Public Transit

Public transit energy consumption includes energy consumed for operation of public buses, electrified rail systems, and ferries. Energy factors used by MTC for buses, BART, commuter rail, and ferries are provided in Table 2.4-2. The energy efficiency of each of these modes may vary according to operating conditions. For example, if a ferry that uses 1.256 million BTU per mile carries 400 passengers on a trip, the energy usage is approximately 3,140 BTU per passenger mile, while a bus that consumes 37,310 BTU per mile uses about 1,245 BTU per passenger mile if it carries 30 passengers.

Table 2.4-2: Energy Factors of Transit Service

Service	Energy Factor (BTU/Vehicle Mile) ^a
Bus	37,310
Light Rail Transit	62,797
Heavy Rail Transit	62,797
Commuter Rail Transit	92,739
Ferry Transit	1,255,797

^a Energy use per passenger mile is less, depending on passenger load of transit vehicle.

Source: Metropolitan Transportation Commission, 2008; U.S. Department of Energy, 2008 (bus and rail); American Public Transit Association, 2008 (ferry)

Energy Used by Private and Commercial Vehicles

Commercial vehicles, generally composed of light, medium, and heavy trucks, are typically fueled by diesel or gasoline, and are part of the general fleet mix of vehicles present within the Bay Area transportation system.

In the short-term, average fuel economy is expected to decrease due to the increase in light duty trucks as a fraction of the light duty vehicle fleet in California. Model year 2000 cars had the lowest recorded fuel economy ratings since 1980, largely due to buyer preferences for sport utility vehicles (21 percent of new car sales in the U.S.). Since 1981, improved engine performance has largely been offset by an increase in the average weight of cars and light duty trucks (10 percent and 16 percent, respectively).

The CEC projects that “fuel efficiency (by class) for gasoline light duty vehicles will decline slightly under model year 2007 or 2008, reflecting recent trends, and then begin to increase.” Light duty vehicles include automobiles, pickup trucks, vans, and sport utility vehicles (SUVs). The anticipated increase is due to the expected addition of hybrid-electric vehicles and the zero

emission vehicle mandate, as well as the replacement of older and lower fuel efficiency vehicles over time.¹³

Energy Use and Global Warming

Scientists and climatologists have cited evidence that the burning of fossil fuels by vehicles, power plants, industrial facilities, residences and commercial facilities have led to an increase of the earth's temperature. While climate changes can result from many natural processes, scientists are certain that human activities are accelerating the warming process. For an analysis of greenhouse gas production and project impacts on climate change, please see *Chapter 2.5: Greenhouse Gases and Climate Change*.

REGULATORY SETTING

Federal and state agencies regulate energy consumption through various policies, standards, and programs. At the local level, individual cities and counties regulate energy through their regulatory and planning activities.

Federal Regulations

Energy Policy and Conservation Act, and CAFE Standards

The Energy Policy and Conservation Act (EPCA) of 1975 established nationwide fuel economy standards in order to conserve oil. Pursuant to this Act, the National Highway Traffic and Safety Administration, part of the U.S. Department of Transportation, is responsible for revising existing fuel economy standards and establishing new vehicle fuel economy standards.

The Corporate Average Fuel Economy (CAFE) program was established to determine vehicle manufacturer compliance with the government's fuel economy standards. Compliance with CAFE standards is determined based on each manufacturer's average fuel economy for the portion of their vehicles produced for sale in the United States. The U.S. EPA calculates a CAFE value for each manufacturer based on city and highway fuel economy test results and vehicle sales. The CAFE values are a weighted harmonic average of the EPA city and highway fuel economy test results. Based on information generated under the CAFE program, the U.S. Department of Transportation is authorized to assess penalties for noncompliance. Under the Energy Independence and Security Act of 2007 (described below), the CAFE standards were revised for the first time in 30 years.

Energy Policy Act of 1992 (EPAct)

The Energy Policy Act of 1992 (EPAct) was passed to reduce the country's dependence on foreign petroleum and improve air quality. EPAct includes several parts intended to build an inventory of alternative fuel vehicles (AFVs) in large, centrally fueled fleets in metropolitan areas. EPAct requires certain federal, state, and local government and private fleets to purchase a percentage of light duty AFVs capable of running on alternative fuels each year. In addition, financial

¹³ California Energy Commission, 2003.

incentives are also included in EAct. Federal tax deductions will be allowed for businesses and individuals to cover the incremental cost of AFVs. States are also required by the act to consider a variety of incentive programs to help promote AFVs.

Energy Policy Act of 2005

President Bush signed the Energy Policy Act of 2005 into law on August 8, 2005. Generally, the act includes provisions for renewed and expanded tax credits for electricity generated by qualified energy sources, such as landfill gas; provides bond financing, tax incentives, grants, and loan guarantees for clean renewable energy and rural community electrification; and establishes a federal purchase requirement for renewable energy.

Energy Independence and Security Act of 2007

On December 19, 2007, President Bush signed the Energy Independence and Security Act of 2007, which is designed to improve vehicle fuel economy and help reduce U.S. dependence on oil. It represents a major step forward in expanding the production of renewable fuels, reducing dependence on oil, and confronting global climate change.

The Energy Independence and Security Act of 2007:

- Increases the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard (RFS) requiring fuel producers to use at least 36 billion gallons of biofuel in 2022, which represents a nearly five-fold increase over current levels; and
- Reduces U.S. demand for oil by setting a national fuel economy standard of 35 miles per gallon by 2020 – an increase in fuel economy standards of 40 percent.

By addressing renewable fuels and CAFE standards, the Energy Independence and Security Act of 2007 will build on progress made by the Energy Policy Act of 2005 in setting out a comprehensive national energy strategy for the 21st century.

State Regulations

Warren-Alquist Act

The 1975 Warren-Alquist Act established the California Energy Resources Conservation and Development Commission, now known as the California Energy Commission (CEC). The Act established a State policy to reduce wasteful, uneconomical and unnecessary uses of energy by employing a range of measures. The California Public Utilities Commission (PUC) regulates privately-owned utilities in the energy, rail, telecommunications, and water fields.

State of California Energy Plan

The CEC is responsible for preparing the State energy plan, which identifies emerging trends related to energy supply, demand, conservation, public health and safety, and the maintenance of

a healthy economy. The current plan is the *1997 California Energy Plan*.¹⁴ The plan calls for the state to assist in the transformation of the transportation system to improve air quality, reduce congestion, and increase the efficient use of fuel supplies with the least environmental and energy costs. To further this policy, the plan identifies a number of strategies, including assistance to public agencies and fleet operators in implementing incentive programs for zero-emission vehicles and addressing their infrastructure needs; and encouragement of urban designs that reduce vehicle miles traveled and accommodate pedestrian and bicycle access.

Assembly Bill 2076: Reducing Dependence on Petroleum

In response to Assembly Bill (AB) 2076 (Chapter 936, Statutes of 2000), the CEC and the California Air Resources Board prepared and adopted a joint agency report, *Reducing California's Petroleum Dependence*. Included in this report are recommendations to increase the use of alternative fuels to 20 percent of on-road transportation fuel use by 2020 and 30 percent by 2030, significantly increase the efficiency of motor vehicles, and reduce per capita vehicles miles traveled.¹⁵ Further, in response to the CEC's 2003 and 2005 *Integrated Energy Policy Reports*, the Governor directed the CEC to take the lead in developing a long-term plan to increase alternative fuel use.¹⁶

A performance-based goal is to reduce petroleum demand to 15 percent below 2003 demand. The options include:¹⁷

- Near-Term Options (could be fully implemented by 2010)
 - Use more fuel efficient replacement tires with proper inflation
 - Improve fuel economy in government fleets
 - Improve private vehicle maintenance
- Mid-Term Options (could be fully implemented in the 2010-2020 time frame)
 - Double fuel efficiency of current model light duty vehicles to 40 miles/gallon
 - Use natural gas-derived Fischer-Tropsch fuel as a 33 percent blending agent in diesel
- Long-Term Options
 - Introduce fuel cell light duty vehicles in 2012, increasing to 10 percent of new vehicle sales by 2020, and 20 percent by 2030

Recommendations include:

¹⁴ California Energy Commission, 1997.

¹⁵ Reducing California's Petroleum Dependence, California Energy Commission and Air Resources Board, joint agency report, August 2003, publication #P600-03-005.

¹⁶ Letter from Governor Arnold Schwarzenegger to the Legislature, attachment: Review of Major Integrated Energy Policy Report Recommendations, August 23, 2005.

¹⁷ California Energy Commission/California Air Resources Board: Reducing California's Petroleum Dependence, August 14, 2003 Final, Adopted, Joint Agency AB 2076 Report, publication # 600-03-006F.

- The Governor and Legislature should adopt the recommended statewide goal of reducing demand for on-road gasoline and diesel to 15 percent below the 2003 demand level by 2020 and maintaining that level for the foreseeable future.
- The Governor and Legislature should work with the California delegation and other states to establish national fuel economy standards that double the fuel efficiency of new cars, light trucks and SUVs.
- The Governor and Legislature should establish a goal to increase the use of non-petroleum fuels to 20 percent of on-road fuel consumption by 2020 and 30 percent by 2030.

Integrated Energy Policy Report

Senate Bill (SB) 1389 (Chapter 568, Statutes of 2002) required the CEC to: "[C]onduct assessments and forecasts of all aspects of energy industry supply, production, transportation, delivery and distribution, demand, and prices. The Energy Commission shall use these assessments and forecasts to develop energy policies that conserve resources, protect the environment, ensure energy reliability, enhance the state's economy, and protect public health and safety." (Public Resources Code Section 25301(a)) This work culminated in the Integrated Energy Policy Report (IEPR).

The CEC adopts an IEPR every two years and an update every other year. The most recent IEPR was adopted on December 5, 2007. Today, the IEPR remains the overall guiding document on energy policy."¹⁸ The 2007 IEPR is the first such report produced since the passage of AB 32, the Global Warming Solutions Act of 2006 (discussed in *Chapter 2.5: Greenhouse Gases and Climate Change*). The 2007 IEPR notes that, prior to the passage of AB 32, energy policy in California focused on ensuring adequate supply at reasonably low prices, limiting dependence on imported fuels and fossil fuels generally, environmental protection, and economic benefit to the state's economy. However, with the passage of AB 32, "California is obligated to meet its previous energy goals, but it must do so while reducing the volume of CO2 emissions."¹⁹ Thus, the focus of the 2007 IEPR is to enable:

- California's industries to meet environmental goals while accommodating economic and population growth;
- Attainment of AB 32 goals to reduce California's greenhouse gas emissions to 1990 levels by 2020; and
- California to meet the challenge of growing energy needs while reducing carbon dioxide emissions.

Senate Bill 1078: California Renewables Portfolio Standard Program

Senate Bill (SB) 1078 (Chapter 516, Statutes of 2002) establishes a renewable portfolio standard (RPS) for electricity supply. The RPS requires that retail sellers of electricity, including investor-

¹⁸ California Public Utilities Commission and California Energy Commission, 2008; p 2.

¹⁹ Ibid.

owned utilities and community choice aggregators, provide 20 percent of their supply from renewable sources by 2017. This target date was moved forward by SB 1078 to require compliance by 2010. In addition, electricity providers subject to the RPS must increase their renewable share by at least 1 percent each year. The outcomes of this legislation will impact regional transportation powered by electricity.

Assembly Bill 1493: Reduction of Greenhouse Gas Emissions

Assembly Bill (AB) 1493 (Pavley) amended Health and Safety Code sections 42823 and 43018.5 requiring the California Air Resources Board (CARB) to develop and adopt, by January 1, 2005, regulations that achieve maximum feasible reduction of greenhouse gases emitted by passenger vehicles, light-duty trucks, and other vehicles used for noncommercial personal transportation in California. The bill prohibits those regulations from taking effect prior to January 1, 2006, in order to give the Legislature time to review the regulations and determine whether further legislation should be enacted prior to the effective date of the regulations. Under the bill, the regulations would apply only to a motor vehicle manufactured in the 2009 model year, or any model year thereafter.

In September 2004, pursuant to AB 1493, the CARB approved regulations to reduce greenhouse gas emissions from new motor vehicles. Under the regulation, one manufacturer fleet average emission standard is established for passenger cars and the lightest trucks, and a separate manufacturer fleet average emission standard is established for heavier trucks. The regulation took effect on January 1, 2006 and set near-term emission standards, phased in from 2009 through 2012, and mid-term emission standards, phased in from 2013 through 2016 (referred to as the Pavley Phase 1 rules). The CARB intends to extend the existing requirements to obtain further reductions in the 2017 to 2020 timeframe (referred to as Pavley Phase 2 rules). The CARB has included both Pavley 1 and 2 rules in its Climate Change Proposed Scoping Plan (October 2008), pursuant to the Global Warming Solutions Act of 2006 (AB 32), which outlines the State's strategy to achieve 2020 greenhouse gas emission reductions. While EPA has refused to grant a waiver that would allow California to implement these standards, and California has challenged this action in federal court, President-elect Obama administration has indicated it would grant the waiver.

The CARB calculates that in calendar year 2016, the Pavley Phase 1 rules will reduce California's GHG emissions by 16.4 million metric tons of carbon dioxide equivalents, and by 2020, Pavley Phase 2 would reduce emissions by 31.7 million metric tons of carbon dioxide equivalents. Further, the AB 1493 new vehicle requirements would cumulatively produce 45 percent more GHG reductions by 2020 compared to the new federal CAFÉ standard in the Energy Independence and Security Act of 2007 (above).²⁰ See *Chapter 2.5, Climate Change and Greenhouse Gases*, for additional details about AB 1493.

²⁰ California Air Resources Board, Comparison of Greenhouse Gas Reductions for the United States and Canada Under ARB GHG Regulations and Proposed Federal 2011-2015 Model Year Fuel Economy Standards, Addendum to February 25 Technical Assessment (2008).

Energy Action Plan

The first Energy Action Plan (EAP) emerged in 2003 from a crisis atmosphere in California's energy markets. The state's three major energy policy agencies (the PUC, the CEC, and the Consumer Power and Conservation Financing Authority [established under deregulation and now defunct]) came together to develop one high-level, coherent approach to meeting California's electricity and natural gas needs. It was the first time that energy policy agencies formally collaborated to define a common vision and set of strategies to address California's future energy needs and emphasize the importance of the impacts of energy policy on the California environment.

In the October 2005 *Energy Action Plan II*, the CEC and the PUC updated their energy policy vision by adding some important dimensions to the policy areas included in the original *EAP* such as the emerging importance of climate change, transportation-related energy issues and research and development activities. The CEC recently adopted an update to the *EAP II* in February 2008 that supplements the earlier EAPs and examines the state's ongoing actions in the context of global climate change.

Assembly Bill 1007: State Alternative Fuels Plan

Assembly Bill (AB) 1007 (Chapter 371, Statutes of 2005) required the CEC to prepare a state plan to increase the use of alternative fuels in California. The CEC prepared the State Alternative Fuels Plan (Plan) in partnership with the California Air Resources Board and in consultation with the other state, federal, and local agencies. The Plan presents strategies and actions California must take to increase the use of alternative non-petroleum fuels in a manner that minimizes costs to California and maximizes the economic benefits of in-state production. The Plan assessed various alternative fuels and developed fuel portfolios to meet California's goals to reduce petroleum consumption, increase alternative fuels use, reduce greenhouse gas emissions, and increase in-state production of biofuels without causing a significant degradation of public health and environmental quality.

Senate Bill 375: Transportation Planning and Sustainable Communities

Senate Bill (SB) 375 (Chapter 728, Statutes of 2008), approved by the legislature and signed by Governor Schwarzenegger in September 2008, requires the state's metropolitan planning organizations, including MTC, to prepare a new element of their regional transportation plans, known as a "Sustainable Communities Strategy," to help California reach its strive to reach its greenhouse gas (GHG) emissions reduction targets. (The 2013 regional transportation plan will be the first Bay Area plan subject to SB 375.) The Sustainable Communities Strategy, which will be jointly developed with the Association of Bay Area Governments (ABAG), as is generally the case for regional growth forecasts, will incorporate three new elements into the regional transportation planning process: a land use component identifying how the region could house growth for up to 20 years, a discussion of resource and farmland areas to be protected, and a demonstration of how the development pattern and the transportation network can work together to reduce GHG emissions. As with any plan that results in GHG emissions reductions through means such as reduced vehicle travel, a secondary benefit would be a reduction in regional energy use.

See Chapter 2.5, *Climate Change and Greenhouse Gases*, for additional details about SB 375.

California Environmental Quality Act (CEQA)

Appendix F of the CEQA Guidelines describes the types of information and analyses related to energy conservation that are to be included in EIRs. In CEQA Appendix F, energy conservation is described in terms of decreased per capita energy consumption, decreased reliance on natural gas and oil, and increased reliance on renewable energy sources. To assure that energy implications are considered in project decisions, EIRs must include a discussion of the potentially significant energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy.

IMPACT ANALYSIS

SIGNIFICANCE CRITERIA

Implementation of the Transportation 2035 Plan would have a potentially significant adverse impact if Plan projects would:

- Criterion 1:** Result in a greater than 5 percent increase in the total consumption of electricity, natural gas, gasoline, diesel, or other non-renewable energy types relative to existing conditions.
- Criterion 2:** Be inconsistent with adopted plans or policies related to energy conservation.

METHOD OF ANALYSIS

Energy consumption includes energy required for operation of the transportation system (private vehicles and public transit) as well as energy used for construction and maintenance of the transportation system. The analysis assumes that the proposed Transportation 2035 Plan is implemented in full in the year 2035. The analysis assesses cumulative impacts; it assumes the implementation of the proposed Transportation 2035 Plan as well as the development of all forecast land use changes and the implementation of anticipated regulatory efforts. For instance, on recommendation from the CARB, the energy analysis, and in particular the significance conclusion, assumes the implementation and enforcement of both Pavley 1 and 2 rules for vehicle fuel efficiency (described in the Regulatory Setting). As a result, the energy analysis is cumulative and accounts for the change in vehicle miles traveled (VMT) that could be attributed to the proposed Project, the additional travel in the regional transportation system generated by planned land uses, as well as the change in vehicle fuel economy that is expected to occur due to higher State standards. This analysis is based on output from MTC's travel demand model.

Direct Energy Consumption

Direct energy is that energy used in the daily operation of the transportation system, including the propulsion of on-road vehicles and transit vehicles under varying conditions. In assessing the direct energy impact, consideration was given to the following factors: fleet mix; annual VMT; and variation of fuel consumption rates over time and by vehicle type.

The direct energy analysis for the proposed Project is based on project year 2035 VMT compared to estimates for both existing conditions (2006) and the No Project Alternative. This analysis compares the estimated gasoline/diesel consumption of vehicles on the regional roadway network (i.e., the portion of the network included in the travel demand model) that would result under implementation of the proposed Transportation 2035 Plan to estimates for the 2006 base year and the future condition if the proposed Project were not adopted. The analysis parallel those in the Air Quality and Greenhouse Gases sections of this EIR in depicting the relative influence of state regulations on energy use by presenting direct energy (fuel use) calculations for conditions without implementation of the so-called Pavley rules to increase vehicle mileage and with implementation only of the Pavley Phase 1 rules, as well as with full implementation of both Pavley Phases 1 and 2 (see Regulatory Setting).

In accordance with CARB recommendations, total energy use and the significance conclusions in this section assume that both Pavley Phases 1 and 2 rules are enforced. For this analysis, MTC uses an average on-road vehicle fleet fuel economy of 17.51 miles per gallon for the baseline (2006) year and 32.1 miles per gallon for the Transportation Plan year 2035. Major differences between existing and future fuel economy include the implementation of Pavley rules and changes in technology. The forecast average speed on all regional roadways under the Transportation 2035 Plan is 29.0 miles per hour.

Indirect Energy Consumption

Indirect energy is the energy required to construct, operate, and maintain the transportation network, as well as to manufacture and maintain on-road vehicles and transit vehicles. Indirect energy consumption also includes changes in energy demand due to a project, such as changes in trip origins and destinations or travel modes. A rough estimate of the energy that would be consumed for construction and maintenance proposed under the Transportation 2035 Plan is made by applying the Input-Output methodology developed by Caltrans (1983). The Input-Output method converts VMT, lanes-miles, or construction dollars into energy consumption based on data from other transportation projects in the United States. Indirect energy consumption due to production of fuel and transportation/transmission to the end users is not included in this analysis, as any such analysis would be speculative.²¹

SUMMARY OF IMPACTS

Direct and Indirect Energy Use

Implementation of the Transportation 2035 Plan, combined with anticipated regional growth and improvements in vehicle technology, would result in lower daily energy consumption relative to existing conditions (2006). Thus the cumulative energy impact is considered to be beneficial.

²¹ The Annual Report on Transportation Statistics, published by the Bureau of Transportation Statistics of the U.S. Department of Transportation only includes end user energy consumption by transportation mode, with no information available on manufacturing transportation fuels or different types of transportation equipment.

Policy Consistency

The analysis of consistency with existing energy plans and policies focuses on the California Integrated Energy Policy Report, as it is the primary guiding document for California energy policy. The most recent version of that report, issued in 2007, calls for California's industries to meet environmental goals while accommodating economic and population growth; attainment of AB 32 goals to reduce California's greenhouse gas emissions to 1990 levels by 2020; and meeting the State's growing energy needs while reducing carbon dioxide emissions.

Strictly speaking, the IEPR only provides explicit policy guidance to the California Energy Commission. However, to the extent that a transportation plan can support or deter statewide energy policy, the proposed Transportation 2035 Plan would generally be consistent with the IEPR because the Plan attempts to leverage transportation funding in ways that reduce the need for transportation energy use, in particular fossil fuels that run automobiles. As stated in *Chapter 1.2: Overview of the Proposed Transportation 2035 Plan*, among the performance objectives embodied in the Plan are reducing vehicle miles traveled, congestion, and carbon dioxide and particulate matter emissions. These key objectives, which will be among the ways the success of Plan implementation is measured, are intended to ensure that growth in the Bay region is consistent with statewide objectives for energy and its related emissions. This analysis concludes that, on a programmatic level, the Transportation 2035 Plan is consistent with the most current statewide guiding energy policy contained in the IEPR. Thus, there is no adverse impact related to consistency between the Transportation 2035 Plan and the primary guiding document for California energy policy. As there is no adverse impact, this conclusion is not repeated in a numbered impact statement.

It should be noted that there are many factors beyond the control of MTC and outside the scope of the proposed Transportation 2035 Plan that could influence future energy use, including State and federal regulatory actions (e.g., changes in fuel economy standards), local land use decisions (i.e., where city and county government approve subsequent development projects and the resulting transportation energy required to travel to and from these projects), global economic factors (e.g., the cost of oil, natural gas, electricity, and other forms of energy), and others. In light of these factors, MTC is somewhat limited in its ability to ensure future transportation energy reductions in the Bay Area. Moreover, to the extent that certain types of energy use would increase during the life of the Plan, much of that increase would be due to regional population growth, which is largely outside the purview of MTC.

On the other hand, some of these wider local, State, or national efforts could assist MTC in its energy conservation efforts. For instance, the newly enacted SB 375, which will require MTC to develop a Sustainable Communities Strategy as part of its regional transportation plan beginning in 2013, would be expected to result in reductions in energy consumption, compared to what would otherwise occur, in future years.

IMPACTS AND MITIGATION MEASURES

Cumulative Impact

2.4-1 Implementation of the proposed Transportation 2035 Plan, combined with regional growth and improvements in vehicle technology, is likely to result in decreased transportation-related energy consumption compared to existing conditions. (*Beneficial*)

Implementation of the Transportation 2035 Plan would result in lower daily energy consumption relative to baseline existing conditions (2006). The proposed Project's daily energy consumption for direct energy (including both auto and transit energy) would be roughly 14.3 percent lower than baseline energy use, with the decline in energy use attributable to an anticipated increase in average miles per gallon for automobiles due to implementation of the Pavley rules regarding vehicle emissions (see discussion under Regulatory Setting), which would more than offset increased vehicle miles traveled. (While transit energy use would increase, cars and trucks would consume more than 96 percent of directly expended transportation energy, and thus would drive the overall decrease in direct energy use.) The proposed Project's direct energy use would be 1.6 percent lower than the estimated 2035 No Project direct energy consumption. This difference between the proposed Project and the No Project alternative is primarily due to slightly lower VMT for the proposed Project. Data used in the direct energy calculations and the results for auto energy use are shown in Table 2.4-3.²²

²² The data in Table 2.4-3 parallel the analyses in the Air Quality and Greenhouse Gases sections of this EIR in depicting the relative influence of state regulations on energy use by presenting separate fuel use calculations for conditions 1) without implementation of the Pavley rules and 2) with implementation only of the Pavley Phase 1 rules. Nonetheless, in accordance with CARB recommendations, total energy use, as shown in Table 2.4-4, and thus the significance conclusion in this section, assume that both Pavley Phases 1 and 2 rules are implemented.

Table 2.4-3: Direct (Non-Transit) Transportation Energy Use in the Bay Area

	Adjusted VMT (daily)	Speed (mph)	Adjusted Fuel Economy (mpg)	Btu/Mile	On-Road Energy Use (BnBtus ^a)
Existing Conditions (2006)	159,232,000	31.0	17.5	7,226	1,151
No Project (2035)					
No Pavley ^b	210,880,000	27.5	17.9	7,068	1,490
Pavley I ^b	210,880,000	27.5	24.2	5,213	1,099
Pavley I and II ^b	210,880,000	27.5	26.9	4,694	990
Proposed Project (2035)					
No Pavley ^b	209,785,000	29.0	18.2	6,956	1,459
Pavley I ^b	209,785,000	29.0	24.6	5,137	1,078
Pavley I and II ^b	209,785,000	29.0	27.3	4,628	971

^a Billion BTU (British Thermal Units) per day

^b “Pavley I” and “Pavley II” refer to implementation of Phases I and II, respectively, of the Pavley rules to increase vehicle mileage, pursuant to California’s AB 1493. See discussion under Regulatory Setting “No Pavley” calculations assume that neither phase of the Pavley rules are enforced.

Source: Metropolitan Transportation Commission Model Outputs 2008, Environmental Science Associates, 2008

There would be indirect energy impacts from the consumption of energy for construction, manufacturing, and maintenance purposes. The average daily indirect energy consumption for the proposed Project would be 38 percent more than 2006 conditions, largely as a result of increased vehicle miles traveled increasing the need for vehicle maintenance and the energy used in manufacture of autos and transit vehicles. Also, less indirect energy is used under existing conditions than under the proposed Project because the proposed Project condition assumes a number of large-scale construction projects. The proposed Project indirect energy consumption would be two percent higher than the No Project alternative indirect energy consumption. The difference can be attributed to more construction of new transportation projects under the proposed Project.

With respect to total transportation-related energy use, the proposed Project is estimated to use about 5.1 percent less transportation energy than under existing conditions, and about 0.5 percent less than the No Project Alternative. The decrease in total energy use from existing conditions is primarily a result of decreased fuel consumption by on-road vehicles (cars and trucks). Given that population is expected to increase over the term of the Plan, per capita transportation energy consumption would decrease by nearly 25 percent from existing conditions. See Table 2.4-4 below for details.

Table 2.4-4: Estimated Daily Direct and Indirect Energy Consumption (in Billion BTUs)

	2006	2035 No Project	2035 Project	Change 2006 to 2035 Project		Change No Project to Project	
				Numerical	Percent	Numerical	Percent
Direct Energy							
On-Road Vehicles	1,150.6	989.8	971.0	-179.7	-15.6%	18.8	1.9%
Transit Vehicles	27.5	37.2	39.3	11.8	42.8%	2.1	5.7%
Direct Energy Total	1,178.2	1,027.0	1010.2	-167.9	-14.3%	-16.8	-1.6%
Indirect Energy							
Manufacturing/Maintenance	249.1	322.7	321.7	72.7	29.2%	-1.0	-0.3%
Construction	-	10.6	21.8	21.8	N/A	11.2	105.7%
Indirect Energy Total	249.1	333.3	343.6	94.5	37.9%	10.3	3.1%
Total Daily Energy	1,427.2	1,360.3	1,353.8	-73.4	-5.1%	-6.5	-0.5%
Per Capita Daily Energy (Btus)	199,358	150,627	149,906	49,452	-24.8%	-721	-0.5%

BTU: British Thermal Units

Note: Numbers may not add due to rounding.

Source: Environmental Science Associates, 2008; Metropolitan Transportation Commission Model Outputs 2008

Mitigation Measures

None required.

2.5 Climate Change and Greenhouse Gases

Global climate change (GCC) is currently one of the most important and widely debated scientific, economic, and political issues in the United States. The anticipated impacts of climate change on California range from water shortages to inundation from sea level rise. Transportation systems contribute to climate change primarily through emissions of certain greenhouse gases (CO₂, CH₄, and N₂O) from on-road mobile sources.

This section of the EIR analyzes quantitatively how implementation of the proposed Transportation 2035 Plan may contribute to global climate change through greenhouse gas emissions related to transportation. In addition, the analysis qualitatively describes the potential impacts of sea level rise on Plan projects themselves and on the regional transportation system as a whole. The climate change analysis is provided in response to the most recent recommendations and guidance materials from the California Office of Planning and Research, the California Air Resources Board, the California Attorney General, and other responsible agencies.

ENVIRONMENTAL SETTING

PHYSICAL SETTING

Global Climate Change

GCC refers to a change in the average air temperature that may be measured by wind patterns, storms, precipitation, and temperature. The baseline by which these changes are measured originates in historical records identifying temperature changes that have occurred in the distant past, such as during previous ice ages. Over the last 10,000 years, the rate of temperature change has typically been incremental, with warming and cooling occurring over the course of thousands of years. During this period, the earth has experienced incremental warming as glaciers retreated across the globe. However, scientists have observed an unprecedented increase in the rate of warming over the past 150 years, roughly coinciding with the global industrial revolution.

GCC is now a widely accepted phenomenon. While scientists are certain that human activities are changing the composition of the atmosphere and that increasing concentrations of greenhouse gases (defined on next page) will change the planet's climate, they are less certain about how much the climate will change, at what rate it will change, or what the exact global, or even regional, effects will be. Nonetheless, the world's leading climate scientists—the IPCC¹—have reached consensus that global climate change is “very likely” caused by humans, and that hotter temperatures and rising sea levels will continue for centuries no matter how much humans control their future emissions. In particular, human influences have:

¹ The Intergovernmental Panel on Climate Change (IPCC) is a scientific intergovernmental body set up by the World Meteorological Organization (WMO) and by the United Nations Environment Programme (UNEP). Its role is to assess on a comprehensive, objective, open and transparent basis the latest scientific, technical and socio-economic literature produced worldwide relevant to the understanding of the risk of human-induced climate change, its observed and projected impacts, and options for adaptation and mitigation.

- *very likely* contributed to sea level rise and increased storm surge during the latter half of the 20th century;
- *likely* contributed to changes in wind patterns, affecting extra-tropical storm tracks and temperature patterns;
- *likely* increased temperatures of extreme hot nights, cold nights and cold days;
- *more likely than not* increased risk of heat waves, area affected by drought since the 1970s, and frequency of heavy precipitation events.²

The IPCC predicts that global mean temperature increase from 1990-2100 could range from 2.0 to 11.5 degrees Fahrenheit. They project a sea level rise of seven to 23 inches by the end of the century, with a greater rise possible depending on the rate of polar ice sheet melting.

According to the California Climate Action Team, accelerating GCC has the potential to cause a number of adverse impacts in California, including but not limited to: a shrinking Sierra snow-pack that would threaten the state's water supply; public health threats caused by higher temperatures and more smog; damage to agriculture and forests due to reduced water storage capacity, rising temperatures, increasing salt water intrusion, flooding, and pest infestations; critical habitat modification and destruction; eroding coastlines; increased wildfire risk; and increased electricity demand.³

While all of these impacts may be felt to some extent in the Bay Area, of particular concern are sea level rise and increased storm surge with the resulting potential for increased coastal erosion, higher storm-surge flooding, more extensive coastal inundation, changes in surface water quality and groundwater characteristics, loss of property and coastal habitats, increased flood risk and potential loss of life, loss of nonmonetary cultural resources and values, impacts on agriculture and aquaculture through decline in soil and water quality, and loss of tourism, recreation, and transportation functions. Also of concern is the potential for GCC to increase fire threat at the urban-wildland interface, and the potential for an imbalance between electricity supply and demand.

Greenhouse Gases

Gases that trap heat in the Earth's atmosphere are called greenhouse gases (GHGs). These gases play a critical role in determining the Earth's surface temperature. Part of the solar radiation that enters Earth's atmosphere from space is absorbed by the Earth's surface. The Earth reflects this radiation back toward space, but GHGs absorb some of the radiation. As a result, radiation that otherwise would have escaped back into space is retained, resulting in a warming of the atmosphere. Without natural GHGs, the Earth's surface would be about 61°F cooler.⁴ This phenomenon is known as the greenhouse effect. However, many scientists believe that emissions from human activities—such as electricity generation, vehicle emissions, and even farming and forestry practices—have elevated the concentration of GHGs in the atmosphere beyond naturally-

² Intergovernmental Panel on Climate Change, 2007a.

³ California Climate Action Team, 2006.

⁴ Ibid.

occurring concentrations, contributing to the larger process of global climate change. The six primary GHGs are:

- **Carbon Dioxide (CO₂)**, emitted when solid waste, fossil fuels (oil, natural gas, and coal), and wood and wood products are burned;
- **Methane (CH₄)**, produced through the anaerobic decomposition of waste in landfills, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion;
- **Nitrous oxide (N₂O)**, typically generated as a result of soil cultivation practices, particularly the use of commercial and organic fertilizers, fossil fuel combustion, nitric acid production, and biomass burning;
- **Hydrofluorocarbons (HFCs)**, primarily used as refrigerants;
- **Perfluorocarbons (PFCs)**, originally introduced as alternatives to ozone depleting substances and typically emitted as by-products of industrial and manufacturing processes;
- **Sulfur hexafluoride (SF₆)**, primarily used in electrical transmission and distribution.

Though there are other gases that can contribute to global warming⁵, these six are identified explicitly in California legislation and litigation as being of primary concern. GHGs have varying potentials to trap heat in the atmosphere, known as global warming potential (GWP), and atmospheric lifetimes. GWP ranges from 1 (carbon dioxide) to 23,900 (sulfur hexafluoride). GHG emissions with a higher GWP have a greater global warming effect on a molecule-by-molecule basis. For example, one ton of CH₄ has the same contribution to the greenhouse effect as approximately 21 tons of CO₂.⁶ GWP is alternatively described as “carbon dioxide equivalents”, or CO₂e. The parameter “atmospheric lifetime” describes how long it takes to restore the system to equilibrium following an increase in the concentration of a GHG in the atmosphere. Atmospheric lifetimes of GHGs range from tens to thousands of years.

California and Bay Area GHG Emissions

GHG emissions contributing to GCC are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors.⁷ The State of California alone produces about 2 percent of the entire world’s GHG emissions, with major emitting sources here including fossil fuel consumption from transportation (41 percent), industry (23 percent), electricity production (20 percent), and agricultural and forestry (8 percent). Much like nations around the world, California government is looking at options and op-

⁵ Diesel particulate matter, which is also referred to as black carbon, is a strong absorber of solar radiation; scientists have known for many years that when black carbon particles combine with dust and chemicals in air they become more efficient in absorbing solar radiation, and black carbon mixtures may be the second biggest contributor to global warming. See California Air Resources Board, *Health Effects of Diesel Particulate Matter* pages 4-5, available at http://www.arb.ca.gov/research/diesel/dpm_draft_3-01-06.pdf [as of October 14, 2008]. See also *Chapter 2.2: Air Quality* of this EIR for an analysis of diesel particulate matter emissions.

⁶ California Climate Action Registry, General Reporting Protocol Version 2.2, 2006.

⁷ California Energy Commission, 2006.

opportunities for drastically reducing GHG emissions with the hope of thereby delaying, mitigating, or preventing at least some of the anticipated impacts of GCC on California communities.

Furthermore, local and regional agencies in the Bay Area have taken steps to measure, quantify, evaluate, and mitigate their contributions to GHG emissions and global warming. For example, the cities of San Francisco, San Jose, and Palo Alto, the East Bay Municipal Utility District, UC Berkeley and Stanford University, and numerous other water and power utilities, public agencies, foundations, and individual businesses are voluntary members of the Climate Action Registry, a private non-profit organization originally formed by the State of California that serves as a voluntary greenhouse gas (GHG) registry to protect and promote early actions to reduce GHG emissions by organizations. Several cities and counties in the Bay Area have already developed or are in the process of completing their own climate/greenhouse gas reduction action plans and inventories (e.g., Alameda County, City of Alameda, Contra Costa County, Marin County, Sonoma County, San Francisco City and County, Berkeley, and Rohnert Park).⁸

In 2006, the Bay Area Air Quality Management District (BAAQMD) completed a baseline inventory of GHG emissions for the year 2002. According to that inventory, 86 million tons of CO₂e were emitted in the Bay Area that year.⁹ Table 2.5-1 shows the emissions breakdown by pollutant.

Table 2.5-1: 2002 Bay Area CO₂e Emissions by Pollutant

<i>Pollutant</i>	<i>Percentage</i>	<i>CO₂e (Million Tons/Year)</i>
Carbon Dioxide	90	77
Methane	5	4
Nitrous Oxide	5	4
HFC, PFC, SF ₆	1	1
Total	100	86

Source: Bay Area Air Quality Management District, 2006

The Bay Area's transportation sector alone contributes 50 percent of the CO₂e GHG emissions, followed by industrial and commercial sources (26 percent), domestic fuel combustion (11 percent), electricity generation at power plants (7 percent), and crude oil refining (6 percent). Bay Area emissions by sector are illustrated in Figure 2.5-1.

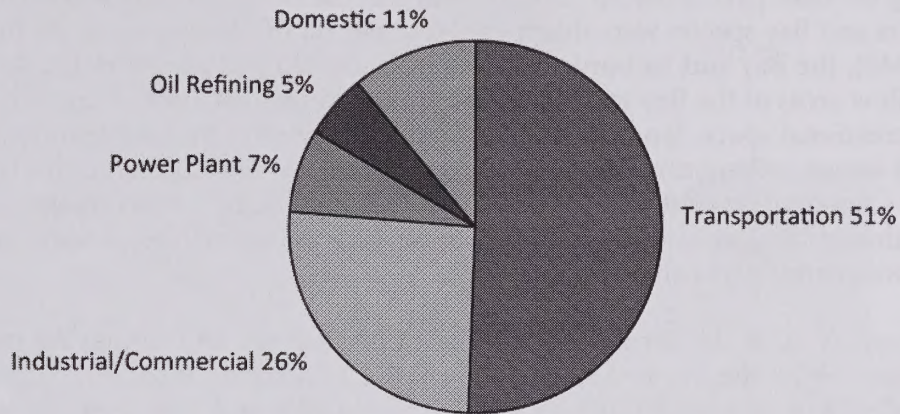
Absent policy changes, Bay Area GHG emissions are expected to grow at a rate of 1.4 percent a year due to population growth and economic expansion.¹⁰ Economic activity variations and the fraction of electric power generation in the region will cause year-to-year fluctuations in the emissions trends. Figure 2.5-2 shows the emission trends by major sources for the period of 1990 to 2016.

⁸ Office of Planning and Research, May 2008.

⁹ Bay Area Air Quality Management District, 2006.

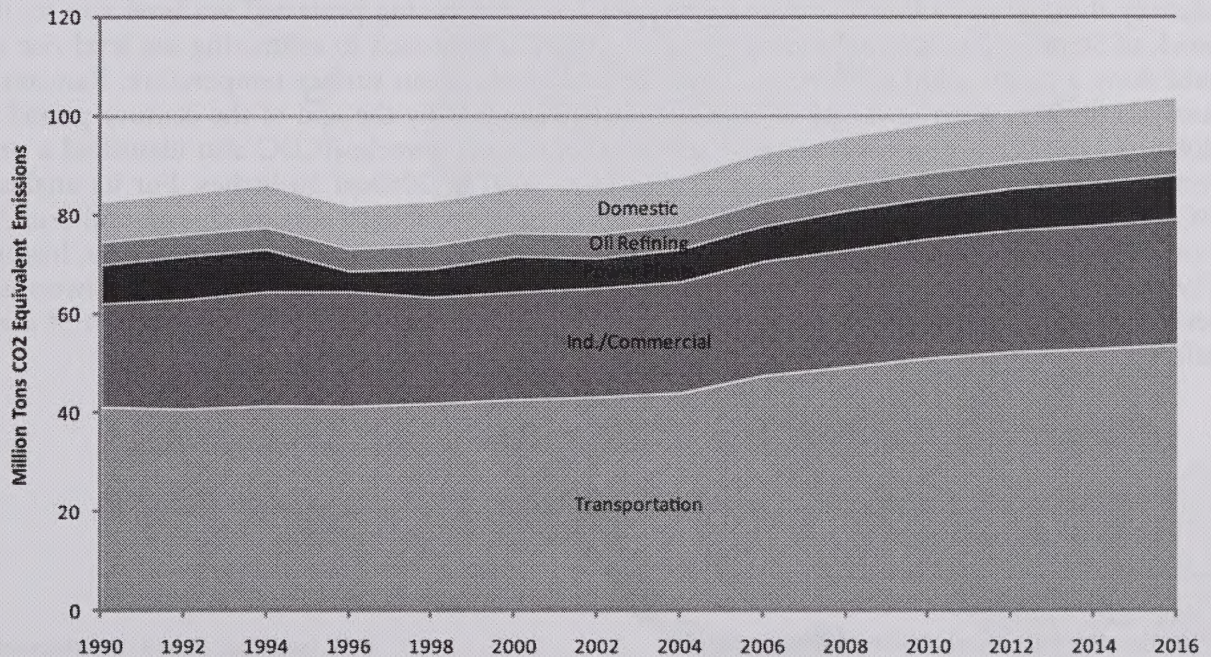
¹⁰ Ibid.

Figure 2.5-1: Bay Area Greenhouse Gas Emissions by Sector, as a Percent of Total Emissions



Source: Bay Area Air Quality Management District, Source Inventory of Bay Area Greenhouse Gas Emissions, 2006

Figure 2.5-2: Bay Area Greenhouse Gas Emissions Trends by Major Source



Source: Bay Area Air Quality Management District, Source Inventory of Bay Area Greenhouse Gas Emissions, 2006

Sea Level Rise

Concern about the San Francisco Bay and its shoreline goes back over a century. The primary concern during the later part of the 20th century was that the size of the Bay was shrinking and its wetland habitats and Bay species were disappearing under fill for development. At the start of the Gold Rush (1849), the Bay and its bordering wetlands covered 787 square miles. As the population grew, shallow areas of the Bay were filled in for various reasons, such as creating arable land, salt ponds, recreational space, landfills and developable property. By mid-century, the Bay was reduced to 548 square miles, only two thirds of its original size. In response to this trend, the San Francisco Bay Conservation and Development Commission (BCDC) was established in 1965 to protect and enhance the Bay and its shoreline, preserving the shoreline for water-oriented uses such as ports, waterfront parks and wildlife refuges.

While the impacts of fill in the Bay and its impacts on Bay habitats and species are still a concern, the major concern about the Bay and its shoreline in the 21st century is sea level rise as a result of GCC. Specifically, many portions of the Bay filled between 1849 and 1965 are now developed and vulnerable to the waters reclaiming that land. Sea level rise is primarily a result of two processes: the thermal expansion of ocean water as temperature increases, and the melting of land ice into the oceans. The IPCC Fourth Assessment Report published in 2007 projected an average sea level rise of anywhere from seven to 23 inches by the end of the century.¹¹ However, some more recent studies suggest that this assessment may be conservative for a variety of reasons, including the observation of an accelerated land ice melt.

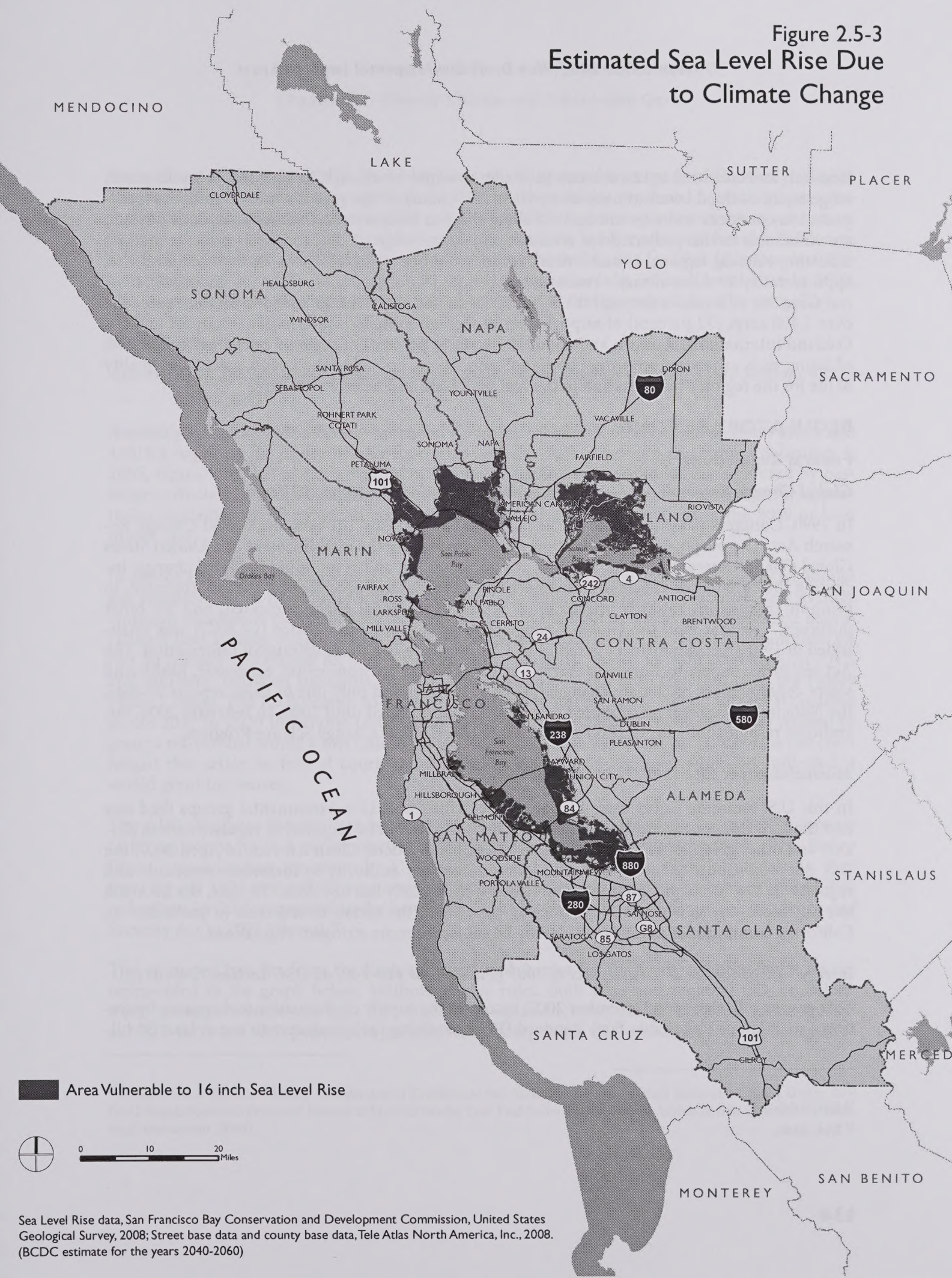
Sea level rise is also a local phenomenon. Some regions show a sea level rise substantially more than the global average, and others a sea level fall.¹² Historical records show that sea level in San Francisco Bay has risen 7 inches over the past 150 years. BCDC has conducted an analysis to identify those areas vulnerable to projected sea level rise, basing projected sea level rise on the work of Stephen Ramstorff who developed an empirical approach to estimating sea level rise establishing a relationship between sea level rise and global mean surface temperature. Ramstorff's analysis projects a sea level rise of approximately 55 inches by the end of the century period of 2080 to 2100 from global warming.¹³ Based on Ramstorff's work, BCDC also identified a projected sea level rise for the mid-century period of 2040 to 2060 of 16-inches. For its analysis, BCDC used data developed by USGS to identify areas vulnerable to climate change and inundation by sea level rise. USGS developed a hydrodynamic model integrating elevation data, historic (1996-2007) tidal data, and estimated increases in sea level based on the relationship between sea level rise and global mean surface temperature. Figure 2.5-3 shows BCDC's projection of areas affected by sea level rise in the period of 2040 to 2060, a sea level rise of 16 inches.

¹¹ Intergovernmental Panel on Climate Change, 2007b.

¹² Ibid.

¹³ San Francisco Bay Conservation and Development Commission, 2008a.

Figure 2.5-3
Estimated Sea Level Rise Due
to Climate Change



Sea Level Rise data, San Francisco Bay Conservation and Development Commission, United States Geological Survey, 2008; Street base data and county base data, Tele Atlas North America, Inc., 2008. (BCDC estimate for the years 2040-2060)

Research indicates that a 12-inch rise in sea level would be enough to shift the 100-year storm surge-induced flood event to once every 10 years.¹⁴ Many of the region's most significant transportation corridors and sites are located along the San Francisco Bay shoreline and, as a result, are vulnerable to this projected sea level rise and storm surge. BCDC estimates indicate that the following existing regional transit infrastructure would be vulnerable to a 16-inch sea level rise: approximately 99 miles of major roads and highways; 70 miles of rail corridor, including the Central Corridor as it passes through the Suisun Marsh, and the Caltrain corridor on the Peninsula; over 3,400 acres (72 percent) of airport areas at the San Francisco International Airport and the Oakland International Airport; and about 100 acres (4 percent) of regional port areas.¹⁵ The cost of losing such infrastructure would be significant. All are critical to the health, safety and quality of life for the region's residents and to the regional, State and federal economy.

REGULATORY SETTING

Federal Regulations

Global Change Research Act (1990) (15 United States Code Sections 2921 et seq.)

In 1990, Congress passed and the President signed Public Law 101-606, the Global Change Research Act. The purpose of the legislation was: "...to require the establishment of a United States Global Change Research Program aimed at understanding and responding to global change, including the cumulative effects of human activities and natural processes on the environment, to promote discussions towards international protocols in global change research, and for other purposes." To that end, the Global Change Research Information Office (GCRIO) was established in 1991 (it began formal operation in 1993) to serve as a clearinghouse of information. The Act requires a report to Congress every four years on the environmental, economic, health and safety consequences of climate change; however, the first and only one of these reports to-date, the *National Assessment on Climate Change*, was not published until 2000. In February 2004, operational responsibility for GCRIO shifted to the U.S. Climate Change Science Program.

Massachusetts v. EPA (2007) (549 U.S. 497)

In this U.S. Supreme Court case, 12 states, three cities, and 13 environmental groups filed suit that the U.S. Environmental Protection Agency (EPA) should be required to regulate carbon dioxide and other greenhouse gases as pollutants under the federal Clean Air Act. In April 2007, the U.S. Supreme Court found that the EPA has a statutory authority to formulate standards and regulations to address greenhouse gases, which it historically has not done. To-date, the EPA still has not taken any new action. It is unclear what effect the action would take, in particular on California communities as they may already be subject to more stringent regulations.

Energy Independence & Security Act of 2007 (Public Law 110-140, 42 USC Section 7545(o) (2))

This energy bill, signed in December 2007, increases the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard (RFS) requiring fuel producers to use at least 36 bil-

¹⁴ Ibid, 2008b.

¹⁵ Ibid, 2008c.

lion gallons of biofuel in 2022. It also tightens the Corporate Average Fuel Economy (CAFE) standards that regulate the average fuel economy in the vehicles produced by each major automaker. The current CAFE standard for cars, set in 1984, requires manufacturers to achieve an average of 27.5 miles per gallon, while a new standard for light trucks and heavier SUVs was adopted in 2006 that would require new vehicles to achieve 24 mpg by 2011 (this standard was later challenged in court). This energy bill requires that standards be increased such that, by 2020, new cars and light trucks sold each year deliver a combined fleet average of 35 miles per gallon.

State Regulations

Assembly Bill 1493 (Chapter 200, Statutes of 2002) (Calif. Health & Safety Code Sections 42823 and 43018.5)

Assembly Bill (AB) 1493 (Pavley) amended California Health & Safety Code sections 42823 and 43018.5 requiring the California Air Resources Board (ARB) to develop and adopt, by January 1, 2005, regulations that achieve maximum feasible reduction of greenhouse gases emitted by passenger vehicles, light-duty trucks, and other vehicles used for noncommercial personal transportation in California. The regulations apply to motor vehicles manufactured in the 2009 or later model year.

In September 2004, pursuant to AB 1493, the ARB approved regulations to reduce greenhouse gas emissions from new motor vehicles. Under the regulation, one manufacturer fleet average emission standard is established for passenger cars and the lightest trucks, and a separate manufacturer fleet average emission standard is established for heavier trucks. The regulation took effect on January 1, 2006 and set near-term emission standards, phased in from 2009 through 2012, and mid-term emission standards, phased in from 2013 through 2016 (referred to as the Pavley Phase 1 rules). The ARB intends to extend the existing requirements to obtain further reductions in the 2017 to 2020 timeframe (referred to as Pavley Phase 2 rules). While EPA has refused to grant a waiver that would allow California to implement these standards, and California has challenged this action in federal court, the President-elect Obama administration has indicated it would grant the waiver.

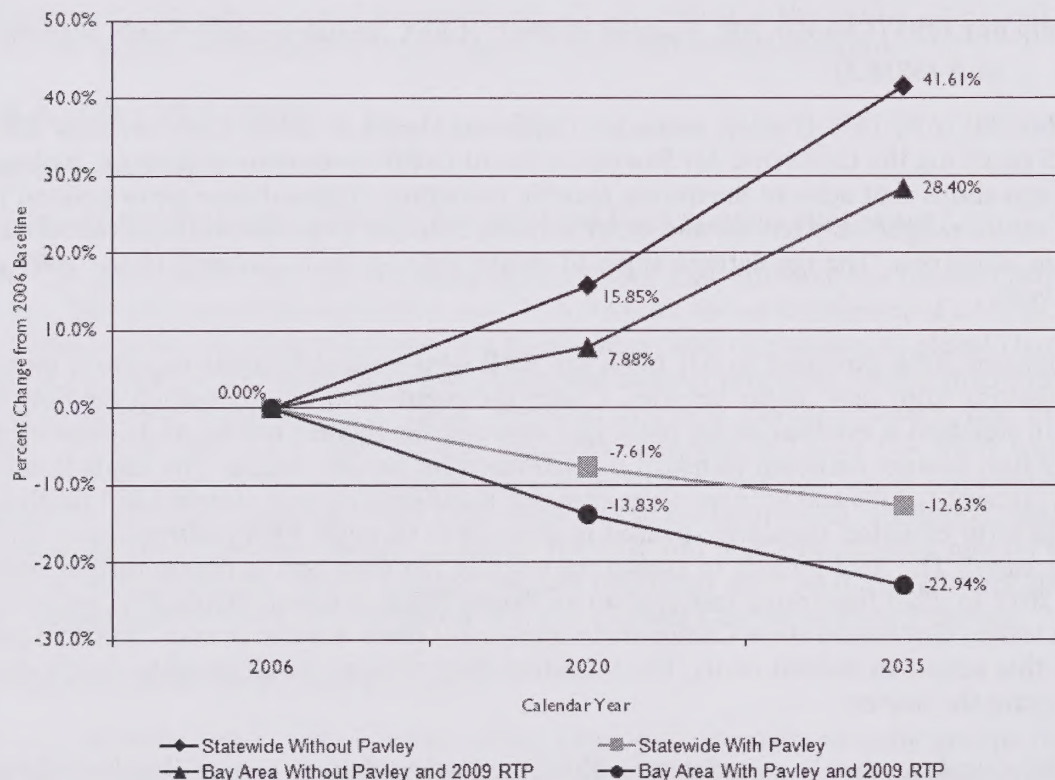
The ARB calculates that in calendar year 2016, the Pavley Phase 1 rules will reduce California's GHG emissions by 16.4 million metric tons of carbon dioxide equivalents, and by 2020, Pavley Phase 2 would reduce emissions by 31.7 million metric tons of carbon dioxide equivalents. Further, the AB 1493 new vehicle requirements would cumulatively produce 45 percent more GHG reductions by 2020 compared to the new federal CAFE standard in the Energy Independence and Security Act of 2007 (above).¹⁶

The estimated benefits from the Pavley Phase 1 and 2 rules for California and the Bay Area are represented in the graph below. Without Pavley rules, both state and regional CO₂ emissions from passenger vehicle and light-duty truck fleet would increase steadily between now and 2035 as VMT increases with population growth; with Pavley rules, CO₂ emissions from passenger ve-

¹⁶ California Air Resources Board, Comparison of Greenhouse Gas Reductions for the United States and Canada Under ARB GHG Regulations and Proposed Federal 2011-2015 Model Year Fuel Economy Standards, Addendum to February 25 Technical Assessment (2008).

hicle and light-duty truck fleet are projected to decrease between now and 2035. This decrease in regional 2035 CO₂ emissions compared to current levels is in large part a result of technological changes expected to reduce CO₂ emissions per VMT. As shown in Figure 2.5-4, the regulations would reduce climate change emissions from the Pavley-affected light duty passenger vehicle fleet by 12.6 percent statewide and 22.9 percent in the Bay Area in the 2035 calendar year compared to 2006.¹⁷

Figure 2.5-4: On-Road Carbon Dioxide Emissions Reductions with Pavley Rules Implementation



Note: Calendar year 2020 percent changes for the Bay Area are indirectly calculated

Source: California Air Resources Board and Metropolitan Transportation Commission (2008)

¹⁷ This Bay Area and Statewide comparison reflects CO₂ emissions from the Pavley-regulated light duty vehicle fleet only, which includes light duty autos (LDA) and light duty trucks (LDT-1, LDT_2, and MDV).

The difference in state versus regional benefits could be attributed to the following:

- The Bay Area has a relative slower population and job growth compared to other major metropolitan areas in the state and our region has higher population growth in urban areas that are served by transit and closer to jobs, which in turn causes a slower rate of growth in vehicle trips and VMT.
- The proposed Transportation 2035 Plan expands transit and road capacity. The transit supply reduces vehicle miles traveled via modal shifts, and the road supply reduces transportation-related greenhouse gas emissions by improving congested freeway speeds.

Executive Order S-3-05 (Gov. Schwarzenegger, June 2005)

Executive Order S-3-05, signed on June 1, 2005, recognizes California's vulnerability to climate change, noting that increasing temperatures could potentially reduce snow pack in the Sierra Nevada, which is a primary source of the State's water supply. Additionally, according to this Order, climate change could influence human health, coastal habitats, microclimates, and agricultural yield. The Order set the greenhouse gas reduction targets for California: by 2010, reduce GHG emissions to 2000 levels; by 2020 reduce GHG emissions to 1990 levels; by 2050 reduce GHG emissions to 80 percent below 1990 levels.

Assembly Bill 1007 (Chapter 371, Statutes of 2005) (Calif. Health & Safety Code Sections 43865 et seq.)

Assembly Bill (AB) 1007 (Pavley) required the California Energy Commission to prepare a state plan to increase the use of alternative fuels in California (State Alternative Fuels Plan). The Energy Commission prepared the plan in partnership with the California Air Resources Board and in consultation with the other state, federal, and local agencies. As required by AB 1007, the State Alternative Fuels Plan (Plan) presents strategies and actions California must take to increase the use of alternative non-petroleum fuels in a manner that minimizes costs to California and maximizes the economic benefits of in-state production. The Plan assessed various alternative fuels and developed fuel portfolios to meet California's goals to reduce petroleum consumption, increase alternative fuels use, reduce greenhouse gas emissions, and increase in-state production of biofuels without causing a significant degradation of public health and environmental quality.

California Global Warming Solutions Act of 2006 (AB 32) (Calif. Health & Safety Code Sections 38500 et seq.)

In September 2006, Governor Arnold Schwarzenegger signed Assembly Bill (AB) 32, the California Global Warming Solutions Act (Health and Safety Code Section 38500 et. seq.). The Act requires the reduction of statewide GHG emissions to 1990 levels by the year 2020. This change, which is estimated to be a 25 to 35 percent reduction from current emission levels, will be accomplished through an enforceable statewide cap on GHG emissions that will be phased in starting in 2012. The Act also directs the ARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources and address GHG emissions from vehicles. The ARB has stated that the regulatory requirements for stationary sources will be first applied to electricity power generation and utilities, petrochemical refining, cement manufacturing, and industrial/commercial combustion. The second group of target industries will include oil and gas production/distribution, transportation, landfills and other GHG-intensive industrial processes.

Senate Bill 1368 (Chapter 598, Statutes of 2006) (Calif. Public Utilities Code Sections 8340 et seq.)

Senate Bill (SB) 1368 required the California Public Utilities Commission (PUC) to establish a GHG emissions performance standard for “baseload” generation from investor-owned utilities by February 1, 2007. The California Energy Commission (CEC) was required to establish a similar standard for local publicly-owned utilities by June 30, 2007. The legislation further required that all electricity provided to California, including imported electricity, must be generated from plants that meet or exceed the standards set by the PUC and the CEC. In January 2007, the PUC adopted an interim performance standard for new long-term commitments (1,100 pounds of CO₂ per megawatt-hour), and in May 2007, the CEC approved regulations that match the PUC standard.

Executive Order S-01-07 (Gov. Schwarzenegger, January 2007)

In January 2007, a Low-Carbon Fuel Standard was established by Executive Order S-01-07. The Order calls for a statewide goal to be established to reduce the carbon intensity of California’s transportation fuels by at least 10 percent by 2020 (“2020 Target”), and that a Low Carbon Fuel Standard (“LCFS”) for transportation fuels be established for California. Further, it directs the ARB to determine if an LCFS can be adopted as a discrete early action measure pursuant to AB 32, and if so, consider the adoption of a LCFS on the list of early action measures required to be identified by June 30, 2007, pursuant to Health and Safety Code Section 38560.5. The LCFS applies to all refiners, blenders, producers or importers (“Providers”) of transportation fuels in California, will be measured on a full fuels cycle basis, and may be met through market-based methods by which Providers exceeding the performance required by a LCFS shall receive credits that may be applied to future obligations of traded to Providers not meeting the LCFS.

In June 2007, the ARB approved the LCFS as a Discrete Early Action item under AB 32. It is expected that the regulatory process at the ARB to implement the new standard will be completed no later than December 2008.

Senate Bill 97 (Chapter 185, Statutes of 2007) (Calif. Public Resources Code Sections 21083.5 and 21097)

Senate Bill (SB) 97 directs the Office of Planning and Research (OPR) to prepare, develop, and transmit to the California Resources Agency guidelines for feasible mitigation of GHG emissions or the effects of GHG emissions, by July 1, 2009. The Resources Agency is required to certify and adopt amendments to the Guidelines implementing the California Environmental Quality Act (“CEQA Guidelines”) on or before January 1, 2010. These new CEQA Guidelines will provide regulatory guidance on the analysis and mitigation of GHG emissions in CEQA documents. In the interim, the OPR offered informal guidance regarding steps lead agencies should take to address climate change in their CEQA documents.¹⁸

¹⁸ Governor’s Office of Planning and Research, *CEQA and Climate Change: Addressing Climate Change through California Environmental Quality Act (CEQA) Review* Technical Advisory, June 19, 2008.

Senate Bill 375 (Chapter 728, Statutes of 2008)

Senate Bill 375 establishes a process for the ARB to implement the state's global warming legislation (AB 32) for the transportation sector by requires ARB to adopt by September 30, 2010 regional greenhouse gas (GHG) targets for emissions associated with the automobile and light truck sector. It establishes a Regional Targets Advisory Committee to recommend protocols for setting the targets by September 30, 2009 and requires ARB to release draft targets by June 30, 2010. More specifically, SB 375 requires MPOs such as MTC to develop a Sustainable Communities Strategy (SCS) – a new element of the regional transportation plan (RTP) – to strive to reach the GHG reduction targets. MTC has developed the proposed Transportation 2035 Plan with the AB 32 GHG reduction targets in mind. MTC's RTP update for 2013 would be the first plan subject to SB 375.

In the Bay Area, the SCS shall be developed in conjunction with ABAG, as has been the historic practice for the land use assumptions of the RTP. The SCS adds three new elements to the RTP: (1) a land use component that identifies how the region could house the entire population of the region over the next eight and 20 years; (2) a discussion of resource and farmland areas to be protected; and (3) a demonstration of how the development pattern and the transportation network can work together to reduce GHG emissions. If the SCS falls short of the ARB targets, SB 375 requires MPO to adopt an "alternative planning strategy" (APS) to achieve them. Because the APS stands outside of the RTP it can include bolder ideas that might be necessary to reach the targets, but that require additional funds or changes in law. SB 375 empowers ARB to review and approve the SCS, but not to modify it. Instead, the MPO must revise the documents until ARB agrees that at least the APS would reach the GHG reduction targets. The bill requires the MPO to conduct extensive outreach with local government officials and adopt a public participation plan for the SCS that includes a minimum number of workshops in each county as well as three public hearings on the draft SCS prior to adoption of a final RTP.

SB 375 provides assurance that transportation projects programmed for funding prior to 2012 and contained in the 2009 federal transportation improvement program, funded by Proposition 1B, or a voter approved sales tax measure approved prior to 2009 will not be subject to new environmental scrutiny under the bill's provisions.

SB 375 synchronizes the regional housing needs assessment (RHNA) process with the RTP process, requires local governments to rezone their general plans, consistent with the updated housing element within three years of adoption, and provides that RHNA allocations must be consistent with the development pattern in the SCS. It moves RHNA to an eight-year cycle from five-year one. Also, SB 375 provides a California Environmental Quality Act (CEQA) exemption or a streamlined process for housing and mixed-use projects that meet specified criteria, such as proximity to transit.

Climate Change Proposed Scoping Plan (pursuant to AB 32)

The Proposed Scoping Plan, approved December 11, 2008, was developed by ARB in coordination with the Climate Action Team (CAT), and proposes a comprehensive set of actions designed to reduce overall greenhouse gas emissions in California, improve the environment, reduce dependence on oil, diversify energy sources, save energy, create new jobs, and enhance public health. The ARB included both Pavley 1 and 2 rules in the Proposed Scoping Plan. The role of MPOs (such as MTC) within the Proposed Scoping Plan is primarily related to establishing and

meeting regional GHG emissions reductions targets for passenger vehicles through the SB 375 process (described above).

California Attorney General Actions

As the chief law enforcement officer of the State, charged by the Constitution to protect the public interest and the State's natural resources, California Attorney General Edmund G. Brown Jr. is committed to doing everything in his power to ensure that California meets its greenhouse gas reduction targets.¹⁹ Examples of the Office of Attorney General's efforts include suing companies in the power industry and the auto industry for their contributions to global warming and writing letters or submitting oral testimony in over 30 different CEQA environmental review processes for city general plans, county general plans, regional transportation plans, and specific projects throughout California. The Attorney General has commented on at least eight County or regional transportation plan EIRs.²⁰ While the ultimate legal implications remain unclear, it is clear that the Attorney General will closely scrutinize the environmental analyses for regional transportation plans. The Attorney General's scoping comments for this DEIR were received on October 1, 2008, and are summarized in Appendix B.

Regional Coordination

In the Bay Area, the Joint Policy Committee (JPC) coordinates the regional planning efforts of ABAG, the BAAQMD, the BCDC and MTC. In fall 2006, the JPC commenced a six-month program to study the issue of climate change and to recommend an initial set of actions to be pursued jointly by the four regional agencies. The study recommends that the regional agencies build their Joint Climate Protection Strategy in service of this key goal: *To be a model for California, the nation and the world.* It then organizes initial actions by six strategy elements: establish priorities, increase public awareness and motivate action, provide assistance, reduce unnecessary driving, prepare to adapt, and break old habits.²¹

As part of the proposed investments in the Transportation 2035 Plan, the region plans to invest \$400 million towards a 5-year Transportation Climate Action Campaign aimed at smart traveling and smart driving in an effort to reduce greenhouse gas emissions from the transportation sector. This action campaign, to be implemented by the four regional agencies, focuses on outreach/education, Safe Routes to Schools, Safe Routes to Transit, transit priority measures (TPMs) for local bus transit, and grants/incentive programs.

¹⁹ The Attorney General Website global warming portal is at <http://ag.ca.gov/globalwarming/>. The portal contains information on global warming generally, impacts in California, and documentation of the comments, speeches, op-eds, testimony, and litigation actions he has taken to support AB 32 goals.

²⁰ Attorney General EIR comment letters are at <http://ag.ca.gov/globalwarming/ceqa/comments.php>.

²¹ May 4, 2007 Joint Policy Committee memo regarding "Bay Area Regional Agency Climate Protection Program – Consolidated Recommendations" can be found at:

http://www.abag.ca.gov/jointpolicy/jpc_agenda_packages.htm.

IMPACT ANALYSIS

SIGNIFICANCE CRITERION

Since the vast majority of the GHG impact of the transportation system is through emissions of CO₂, for purposes of this regional climate change and greenhouse gas emissions analysis, implementation of the Transportation 2035 Plan would have a potentially significant adverse impact if Plan projects would:

Criterion 1: Result in an increase in CO₂ emissions from on-road mobile sources compared to existing (2006) conditions.

For this program EIR, MTC has selected this criterion as the most responsible and comprehensive approach to this GHG impact analysis since it addresses the cumulative impact of implementing all transportation projects in the Plan, whereas the impact of individual projects is less certain and may be individually insignificant. The choice of criterion is based, in part, on the most current guidance document issued by the California Air Pollution Control Officers Association (CAPCOA).²²

METHOD OF ANALYSIS

Until official state guidance from OPR and California Resources Agency is issued, lead agencies responsible for complying with CEQA are using all of the resources available to guide environmental review processes in the interim.²³

The greenhouse gas analysis focuses on emissions from the transportation system, which include CO₂, CH₄, and N₂O. Other greenhouse gases are not quantified because they are not byproducts of fossil fuel combustion related to the transportation system. This analysis relies on air emission calculations performed for the DEIR air quality analysis. The methodology used to quantify mo-

²² Probably the most current and comprehensive guidance document right now is the California Air Pollution Control Officers Association (CAPCOA) white paper entitled *CEQA and Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act*, published in January 2008. This white paper discusses evaluating and addressing greenhouse gas emissions under CEQA in order to provide a common platform of information and tools to support local governments. While not intended to dictate the manner in which a lead agency chooses to address GHGs, this paper provides a coherent look at the tools and techniques available, and suggests possible advantages and disadvantages of each analytical approach. The CAPCOA white paper discusses three basic paths lead agencies could take when contemplating CEQA thresholds of significance for GHG emissions (CAPCOA, 2008): 1. A “no threshold” approach, wherein the lead agency determines there are sufficient reasons to not specify a universal threshold for GHG emissions, and instead requires analysis on a project-by-project basis; 2. A “zero emissions” threshold, wherein the lead agency finds that any increase in GHG emissions is potentially significant under CEQA and therefore all projects under the lead agency must quantify and mitigate GHG emissions regardless of the size of the project, or prepare EIRs to disclose the unmitigable significant impact; or 3. A “non-zero” threshold, wherein the lead agency decides that there are certain GHG emission sources that are so small they will not contribute substantially to the global GHG problem, and sets thresholds of significance, or a de minimis value for cumulative impact.

²³ The Governor’s Office of Planning & Research (OPR) issued a Technical Advisory entitled *CEQA and Climate Change: Addressing Climate Change through California Environmental Quality Act (CEQA) Review* (June 19, 2008). The OPR’s recommended approach is for each CEQA lead agency needs to develop its own approach to performing a climate change analysis for projects that generate GHG emissions.

tor vehicle emissions is described in greater detail in *Chapter 2.2: Air Quality*. The description below highlights the components of the air quality analysis most relevant to greenhouse gases and climate change.

MTC determined that there was insufficient information to evaluate construction-related GHG emissions at the program level, based on consultation with peer regional transportation agencies and staff knowledge of existing emissions modeling capabilities. Therefore, this EIR describes construction-related GHG emission qualitatively as a contributor to overall emissions levels, and assumes that construction emissions will be analyzed in detail and mitigation measures refined during the environmental review conducted at the project level. See *Chapter 2.2: Air Quality* for a full description of the method of analysis for construction-related emissions, the reasons why quantification was not used, as well as discussion of impacts and mitigation measures.

CO₂ and CO₂e Emissions

This analysis focuses primarily on carbon dioxide (CO₂) emissions related to the operation and maintenance of the transportation system. MTC generates the vehicle activity data from its travel demand forecasting models, as well as uses the latest ARB emissions model, EMFAC2007, to calculate the CO₂ emissions from motor vehicle sources. EMFAC also accounts for the effects of congestion (changes in average vehicle speeds) on CO₂ emissions. ARB indicated that it will be able to enforce AB 1493, and advised MTC to factor in reductions in carbon dioxide emissions that would result from the regulation. In a consultation meeting, the California Attorney General's office concurred with this approach. Because EMFAC does not yet incorporate new regulations for improved vehicle fuel economy, MTC adjusts the CO₂ emissions using ARB's spreadsheet models. These spreadsheet models adjust the light duty auto and light duty truck emission factors by model year. This yields emission factors weighted by age of the on-road fleet. MTC uses these adjusted emission factor to estimate the CO₂ emissions from on-road mobile sources. The analysis displays both CO₂ and CO₂e emissions estimates because, while the vast majority of transportation emissions impact is related to CO₂, discussions of greenhouse gas emissions are frequently in terms of carbon dioxide equivalents. Transportation CO₂e emissions include a very small contribution from CH₄ and N₂O emissions, in addition to CO₂. EMFAC2007 does not produce total CO₂e emissions inventory estimates. As recommended by the BAAQMD, MTC calculated CO₂e by applying a ratio of 1.00:1.02 to all EMFAC2007 generated CO₂ inventory estimates for years 2006 and 2035 to convert them to CO₂e emissions.

A programmatic analysis necessarily evaluates the full buildout conditions of the Transportation 2035 Plan. However, at the request of the California Attorney General's office, a qualitative evaluation of interim conditions is provided in the impact analysis.

Sea Level Rise

This analysis includes a qualitative assessment of the impact of sea level rise on the proposed Transportation 2305 Plan projects. The transportation infrastructure projects are mapped against estimated sea level rise for the Bay Area (as provided by BCDC). General observations about where future sea level changes may conflict with proposed new or improved transportation infrastructure investments are made. The implications of potential impact relative to existing conditions are highlighted.

Comparison with the No Project

As stated above, the impact analysis for purposes of determining the significance of impacts focuses on the comparison of the proposed Transportation 2035 Plan to existing conditions (2006). However, the analysis also compares projected emissions from the future condition with the Transportation 2035 Plan to the expected future condition if no new plan were adopted (i.e., the No Project alternative or future baseline). This comparison provides a meaningful perspective on the potential impacts and benefits of the Transportation 2035 Plan.

SUMMARY OF IMPACTS

CO₂ Emissions

Carbon dioxide emissions rates at buildout of the proposed Transportation 2035 Plan would be 14,000 tons per day (16 percent) lower than existing conditions. The major reason for this decrease is the implementation of California's greenhouse gas emissions standards for passenger vehicles. This result illustrates the value of improving technology and standards for emissions given that population size and employment levels are expected to increase. It is expected that CO₂ emission rates will increase during interim years through 2010, after which implementation of Statewide regulations will take effect. As operational CO₂ emissions rates are projected to be reduced below existing levels through the horizon year of the proposed Project, and as the anticipated increase in VMT over the planning period is primarily due to regional growth and development outside the scope of Transportation 2035 Plan projects, the proposed Project's contribution to the significant cumulative impact of global climate change is not cumulatively considerable.

Sea Level Rise

Many of the region's most significant transportation corridors and sites are located along the San Francisco Bay shoreline. All are critical to the health, safety and quality of life for the region's residents and to the regional, state and federal economy. The incremental difference in exposure to risk of sea level rise between existing conditions and the proposed Transportation 2035 Plan future condition is individually less than significant because most of the risk is already present in the existing system. However, the impact relative to existing conditions may be cumulatively significant when considered in conjunction with anticipated new population growth and development. In particular, land use projections that anticipate or target more dense development in the central Bay Area urban areas may also inadvertently increase risk of sea level rise impacts because the areas targeted for more density are generally closer to the Bay margins. Furthermore, mitigation measures designed to protect infrastructure and communities from sea level rise also have the potential to contribute to climate change through the emissions produced during construction. Therefore, careful consideration and priority should be given to long-term "soft" solutions (such as wetlands creation) over short-term "hard" solutions that both consume resources and emit GHGs. With mitigation measures in place, the proposed Project's contribution to the significant cumulative impact of regional sea level rise is not cumulatively considerable.

IMPACTS AND MITIGATION MEASURES

Cumulative Impact

2.5-1 Implementation of Transportation 2035 Plan projects, combined with forecast regional growth, would contribute to GHG emissions. (*Significant Cumulative Impact, Contribution Not Cumulatively Considerable*)

It is reasonable to generalize that global climate change is a significant cumulative impact, as the scientific community has acknowledged its detrimental effects on ecosystems and human communities, and it is caused by the cumulative greenhouse gas emissions from human activities across the globe and over many decades. Furthermore, as global climate change is accelerated by greenhouse gases, any additional greenhouse gas emissions beyond what exists today in the atmosphere can generally be considered to contribute somewhat to this significant cumulative impact. However, for the purposes of this EIR, this analysis needs to make a determination about whether the proposed Project makes a *cumulatively considerable contribution* to the overall cumulative impact.

As shown in Table 2.5-2 below, carbon dioxide emissions from the regional transportation system (in year 2006) are close to 90,000 tons per day. The proposed Transportation 2035 Plan, with implementation of the Pavley Phase 1 and Phase 2 rules for greenhouse gas emissions standards for new cars, is expected to result in about 76,000 tons of carbon dioxide emissions per day by 2035, reducing emissions rates by 14,000 tons per day (16 percent) compared to existing conditions.

As explained in more detail in *Chapter 2.12: Growth-inducing Impacts*, the transportation system itself is not inducing growth in vehicle miles traveled, but rather that growth is a result of overall regional demographic and employment changes that are unrelated to the transportation investments proposed in the Transportation 2035 Plan. This fact is established through a comparison of the proposed Project to No Project alternative under future conditions (2035), which indicates a decrease in VMT. This suggests that while increases in VMT over the planning period are contributing somewhat to the significant cumulative impact of global climate change, the role of the proposed Project is not cumulatively considerable. This conclusion is consistent with that of the growth-inducing impact assessment in Chapter 2.12.

Table 2.5-2: Existing and Future CO₂ and CO₂e Emissions¹ (1000s of tons/day)

	2006	2035	2035	Change 2006 to 2035 Project		Change 2035 No Project to 2035 Project	
	Existing	No Project	Project	Numerical	Percent	Numerical	Percent
CO ₂ Emissions (Pavley I and 2) ^a	89.6	77.1	75.6	-14.0	-16%	-1.5	-2%
CO ₂ Emissions (Pavley I Only)	89.6	85.6	83.9	-5.7	-6%	-1.7	-2%
CO ₂ Emissions (No Pavley)	89.6	116.0	113.6	24.0	27%	-2.4	-2%
CO ₂ e Emissions (Pavley I and 2)	91.4	78.6	77.1	-14.3	-16%	-1.5	-2%
CO ₂ e Emissions (Pavley I Only)	91.4	87.3	85.6	-5.8	-6%	-1.7	-2%
CO ₂ e Emissions (No Pavley)	91.4	118.3	115.9	24.5	27%	-2.4	-2%

¹ EMFAC2007 does not produce total CO₂e emissions estimates. As recommended by the BAAQMD, MTC applied a ratio of 1.00:1.02 to all EMFAC2007 generated CO₂ estimates for 2006 and 2035 to convert them to CO₂e. The CO₂ and CO₂e

emissions estimates shown here are from the entire on-road mobile source inventory, including heavy trucks. Note that the CO₂ emissions estimates shown in Figure 2.5-4 only reflect emissions from Pavley-regulated light duty passenger vehicles.

^a The Pavley rules are described in the regulatory setting. ARB has committed to implement the more stringent Pavley Phase 2 rules as part of the required 2006 Global Warming Solutions Act's (AB 32) Scoping Plan. However, Table 2.5 shows the carbon dioxide emissions without the Pavley Phase 2 rules enforced as a way to illustrate the impact of the Pavley Phase 2 rules on carbon dioxide emission levels. Without Pavley Phase 2, the proposed Project would result in an increase of 24,000 tons per day of carbon dioxide (27 percent) compared to existing conditions. Without Pavley Phase 2, the proposed Project would still result in 2 percent fewer emissions than the No Project Alternative.

Source: Metropolitan Transportation Commission, 2008

When compared to the No Project alternative, the proposed Project produces about 1,500 tons per day (2 percent) fewer carbon dioxide emissions. This difference, primarily a result of slightly lower VMT with the proposed Project, is due to the additional funding for transit and roadway improvements and other alternative modes contained in the proposed Project but missing from the investment plan for the No Project alternative. In addition, transportation investments such as the Freeway Performance Initiative that improves freeway operations by reducing stop-and-go traffic and increasing vehicle speeds at congested conditions also contribute to the fewer carbon dioxide emissions.

As CO₂ emissions rates are projected to be reduced below existing levels through the horizon year of the proposed Project, and as the anticipated increase in VMT over the planning period is primarily due to regional growth and development outside the scope of Transportation 2035 Plan projects, the proposed Project's contribution to the significant cumulative impact of global climate change is not cumulatively considerable.

Interim Years

As described in *Chapter 2.1: Transportation* and *Chapter 2.2: Air Quality*, overall VMT is expected to increase between now and the year 2035, and it is primarily the new state regulations on fuel efficiency that are expected to reduce vehicle emissions. The basic differences in buildout emissions rates by Pavley implementation are also displayed in Table 2.5-2. More specifically, an initial on-road mobile source carbon dioxide emissions assessment of pre-Pavley rule and post-Pavley rule implementation conditions was prepared to examine changes in CO₂ emissions during the 25-year planning horizon of the proposed Project. Based on this assessment, regional carbon dioxide emissions from motor vehicles are estimated to increase and peak around year 2010 because the region will experience increases in VMT, but Pavley Phase 1 will not yet be fully implemented (it only applies to 2009 and later model year vehicles and Pavley implementation may be gradual when accounting for time for EPA approval processes, time for auto manufacturers to re-tool, etc.). After 2010, regional CO₂ emissions are expected to decline as the Pavley Phase 1 rules are fully implemented, and will continue to decline in later years as Pavley Phase 2 rules are fully implemented.

Regional Policy Efforts to Reduce the Cumulative Impact

Beyond the network modeling considerations analyzed above, there are policy efforts already underway and funded in the proposed Transportation 2035 Plan that work to address the Bay Area's contribution to global climate change. MTC, ABAG, BCDC, and BAAQMD—as represented through the Joint Policy Committee (JPC) which coordinates the regional planning efforts of the four agencies—have already committed to working together to implement:

- **The Bay Area Regional Agency Climate Protection Program:** In May 2007, the JPC adopted this program that lays out an initial set of actions to address the threat of climate change. The regional agencies have assigned staff resources to a Bay Area Climate Protection Team to implement the program. The role of the team is multi-faceted and includes tasks such as: seeking opportunities to partner on climate protection initiatives with others from the public, private and voluntary sectors; sponsoring climate change workshops; developing a climate-change awareness and action campaign; and developing a proposal for a consolidated regional assistance program which most efficiently meets regional needs.²⁴
- **Transportation Climate Action Campaign:** The proposed Transportation 2035 Plan dedicates \$400 million to a 5-year regional Transportation Climate Action Campaign to help implement strategies contained in the JPC's Bay Area Regional Agency Climate Protection Program. Features of the climate action campaign include an expansive public outreach, education and incentives effort to alter driving and travel behaviors and offer a suite of complementary action-oriented initiatives such as a regional climate grant program, Safe Routes to Schools, Safe Routes to Transit, transit priority measures program to improve bus transit reliability, regional rideshare program and plug-in hybrid vehicle program. Another \$45 million was dedicated to the Particulate Matter Reduction Program to address diesel particulate matter emissions from goods movement activities. See MTC's Draft Transportation 2035 Plan for more information.²⁵
- **The Bay Area 2009 Clean Air Plan:** The BAAQMD, as the lead agency, in consultation with MTC, ABAG and BCDC, is preparing its Bay Area 2009 Clean Air Plan, which is the update to the 2005 Ozone Strategy. This plan will document progress towards attaining state standards and recommend reduction strategies for ground-level ozone. The plan will be expanded to identify reduction strategies for multiple pollutants, including carbon dioxide emissions. This plan is expected to be adopted by the BAAQMD in late 2009.

These interagency and interdisciplinary programs create a foundation for ongoing measurement, monitoring, and evaluation of progress toward regional and statewide climate change goals.

Mitigation Measures

Because of the urgent need to respond to the challenges of global warming, and because MTC recognizes that future emissions rates might go up without successful implementation of statewide policy to increase fuel efficiency, the following additional measures are recommended to reduce GHG emissions related to the proposed Plan:

2.5(a) MTC shall commit to working with ABAG, BCDC, and BAAQMD, through the JPC, to develop a set of "green construction" policies and best practices that encourage use of lowest emitting construction equipment and fuels (e.g., diesel-powered vehicles meeting the most current ARB-certified tier or better engines).

²⁴ See the May 2007 JPC staff memo that outlines the Bay Area Regional Agency Climate Protection Program at: <http://www.abag.ca.gov/jointpolicy/Regional%20Agencies%20Climate%20Protection%20Program.pdf>

²⁵ All MTC supplemental technical reports for the Transportation 2035 Plan for the San Francisco Bay Area are posted on MTC's website at: www.mtc.ca.gov.

2.5(b) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce impacts related to greenhouse gas emissions that shall be considered by project sponsors and decision-makers may include, but are not limited to, those described below.

- Adopt and implement “green building” standards for any public buildings (transit stations, ferry buildings, maintenance facilities, etc) funded by MTC to achieve a LEED™ Silver or better or equivalent certification.
- Use light colored pavement for solar reflectivity and reduced heat island effects wherever construction costs are no higher than 5 or 10 percent of the least cost alternative paving material.
- Install solar photovoltaic systems or use of renewable sources of energy for transportation buildings and maintenance facilities, wherever “feasible”, as the term is defined in CEQA.
- Plant shade trees as part of specified types of construction projects or wherever construction results in loss of tree cover, because trees have carbon sequestration capacity.
- Establish or update minimum standards for construction management, including specifying minimum content for recycled products in aggregate, concrete, etc. and construction waste management.²⁶
- Establish standards or incentives for light pollution reduction related to street lighting and lighting of transportation and parking facilities to promote low-energy use for permanent as well as temporary fixtures.

See also *Chapter 2.1: Transportation* and *Chapter 2.2: Air Quality* which contain mitigation measures that would help to further reduce greenhouse gas emissions from transportation projects, such as measures 2.1(a) through 2.1(c) and 2.2(d) through 2.2(f). Despite feasible mitigation, this overall cumulative impact is expected to remain significant and unavoidable because of regional growth. However, the proposed Project’s contribution to the overall significant cumulative impact is not cumulatively considerable.

Cumulative Impact

2.5-2 Transportation 2035 Plan projects, combined with forecast regional growth, have the potential to result in a cumulatively considerable increase in exposure to risk related to sea level rise. (*Significant Cumulative Impact, Contribution Cumulatively Considerable, Mitigable*)

²⁶ In a May 2007 letter, for example, the AG mentioned the value of “warm mix” asphalt to reduce GHG emissions as a feasible alternative paving material. Alameda County also has noted the value of requiring use of fly ash in concrete in its Green Building guidance materials.

Sea level rise is a global repercussion of climate change; thus the direct influence of Bay Area GHG emissions on Bay Area sea level rise is impossible to determine with any certainty. Nonetheless, sea level rise is likely to have widespread effects on coastal structures, infrastructure, beaches, wetlands, agricultural lands, and water supply. As described in the environmental setting, many of the region's most significant transportation corridors and sites are located along the San Francisco Bay shoreline and, as a result, are vulnerable to projected sea level rise and storm surge. Future investment in transportation improvements along these same corridors—particularly new infrastructure or increased capacity without the necessary protective measures—is likely to increase overall system vulnerability to sea level rise and storm surge.

Based on a visual comparison of the inundation areas depicted in Figure 2.5-1 and a list of proposed Transportation 2035 Plan projects that involve significant construction, widening, and extension of infrastructure, examples of investment projects that are vulnerable to future sea level rise include improvements proposed along U.S. 101 in Marin, various stretches of U.S. 101 between Millbrae and Mountain View, and stretches of I-680 north of Benicia. Major rail corridors such as the Central Corridor as it passes through the Suisun Marsh and the Caltrain corridor on the Peninsula, already vulnerable, will expose more people and goods to risk as these corridors are improved and capacity is increased.

The impact relative to existing conditions may be cumulatively significant when considered in conjunction with anticipated new population growth and development. In particular, land use projections such as *Projections 2007*, and programs such as the FOCUS PDAs, anticipate or target denser development in the central Bay Area urban areas and thus may also inadvertently increase risk of sea level rise impacts because the areas targeted for more density are generally closer to the Bay margins.

Through the proposed Plan, MTC is funding research to evaluate the areas at risk for sea level rise along the California coast and the San Francisco Bay and to assess the value of the areas at risk and provide an estimate of the cost of protecting those areas. The report will contain a set of recommendations for policy and decision makers to use as they develop land use plans for areas within coastal and Bay shoreline regions that are vulnerable to sea level rise.

The contribution of the proposed Project to the increase in exposure to risk of sea level rise is somewhat diminished because most of the risk is already present in the existing system. However, the existing system is unprotected and both existing and future critical public infrastructure and development on the Bay and coast shorelines may require protection to prevent inundation and flooding from sea level rise. Additional mitigation measures are thus necessary to ensure that Plan projects are implemented in such a way as to reduce future regional vulnerability.

Mitigation Measures

Extensive planning is necessary to determine the appropriate form of shoreline protection over both the short- and long-term. It may be necessary to protect certain locations with hard engineering elements such as sea walls in the short-term, while softer solutions such as wetlands restoration are appropriate from a long-term perspective. Short-term solutions sometimes lead to additional impacts on the Bay ecosystem and shoreline environments. Furthermore, virtually all new protective infrastructure required as mitigation against the risk of sea level rise will also incrementally contribute to additional greenhouse gas emissions and climate change through con-

struction-related emissions. Thus, agencies should seek out long-term solutions and mitigation options as early in the process as possible to avoid these secondary impacts.

The following mitigation measures take these factors into consideration and provide defensible next steps for both regional agencies and project sponsors.

2.5(c) MTC will work with BCDC, in partnership with the regional agencies and other partners who would like to participate, to conduct a vulnerability assessment for the region's transportation infrastructure and identify the appropriate adaptation strategies to protect those transportation resources that are likely to be impacted and are a priority for the region to protect. This assessment should build off of but not duplicate current BCDC efforts and research underway.

2.5(d) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce impacts related to sea level rise that shall be considered by project sponsors and decision-makers may include, but are not limited to, those described below.

- Engineering designs for new transportation projects shall demonstrate that they have factored in sea level rise and potential increases in storm surge inundation, and are budgeting for and already incorporate mitigation measures to adapt to projected sea level rise and storm surge. These mitigation measures should consider the effects on Bay and coastal zone resources and avoid or reduce future risk to the infrastructure and the region.
- For those transportation projects that do not involve new infrastructure but increase capacity of existing infrastructure, project sponsors shall demonstrate that they have investigated the vulnerability of their existing facilities to sea level rise and storm surge inundation and have budgeted for mitigation measures to adapt to projected sea level rise and storm surge. These mitigation measures should consider the effects on Bay and coastal zone resources and avoid or reduce future risk to the infrastructure and the region.

See also *Chapter 2.1: Transportation* and *Chapter 2.2: Air Quality* which contain mitigation measures that would help to further reduce greenhouse gas emissions from transportation projects, such as measures 2.1(a) through 2.1(c) and 2.2(d) through 2.2(f). See also mitigation measures under Impact 2.5-1 related to greenhouse gas emissions. Despite feasible mitigation, this overall cumulative impact is considered significant and unavoidable because of regional growth. However, with the above mitigation, the proposed Project's contribution to the overall significant cumulative impact is not cumulatively considerable.

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2.6 Noise

In most of the Bay Area, transportation—motor vehicles, transit systems, railroads, aircraft, and boats—is the primary source of environmental noise. Automobile and truck traffic is the most prevalent noise source throughout the region’s urban communities. Noise can have real effects on human health, including hearing loss and psychological effects or irritability from lack of sleep.

This chapter outlines how noise is described, measured, and regulated. It also describes the sources of transportation noise in the Bay Area and evaluates the potential effect of transportation improvements in the proposed Transportation 2035 Plan on noise levels within the region. The study area analyzed is the entire nine-county San Francisco Bay Area, but the analysis focuses primarily on areas where the bulk of transportation and transit improvements are proposed in the Transportation 2035 Plan.

ENVIRONMENTAL SETTING

PHYSICAL SETTING

Noise Descriptors

Sound waves, traveling outward from a source, exert a sound pressure level (commonly called “sound level”), measured in decibels (dB). In general, people can perceive a two- to three-dB difference in noise levels; a five-dB difference in noise levels is readily perceptible; and a difference of 10 dB is perceived as a doubling of loudness. “Noise” is often defined as unwanted sound. Perceptions of sound and noise are highly subjective and vary greatly from person to person. A decibel is 10 times the logarithm of a ratio of a sound pressure level squared to the reference sound pressure squared. The reference sound pressure is the smallest sound pressure audible to humans. A healthy human hearing system can detect an extremely wide range of sound pressures. By using logarithms, the decibel system condenses this wide range to one that is more convenient, ranging from 0 dB (threshold of hearing) to 140 dB (threshold of pain). Environmental noise is usually measured in A-weighted decibels, which is a metric corrected for the variation in frequency response of the human ear. The A-weighted scale is used to describe all noise levels discussed in this section.

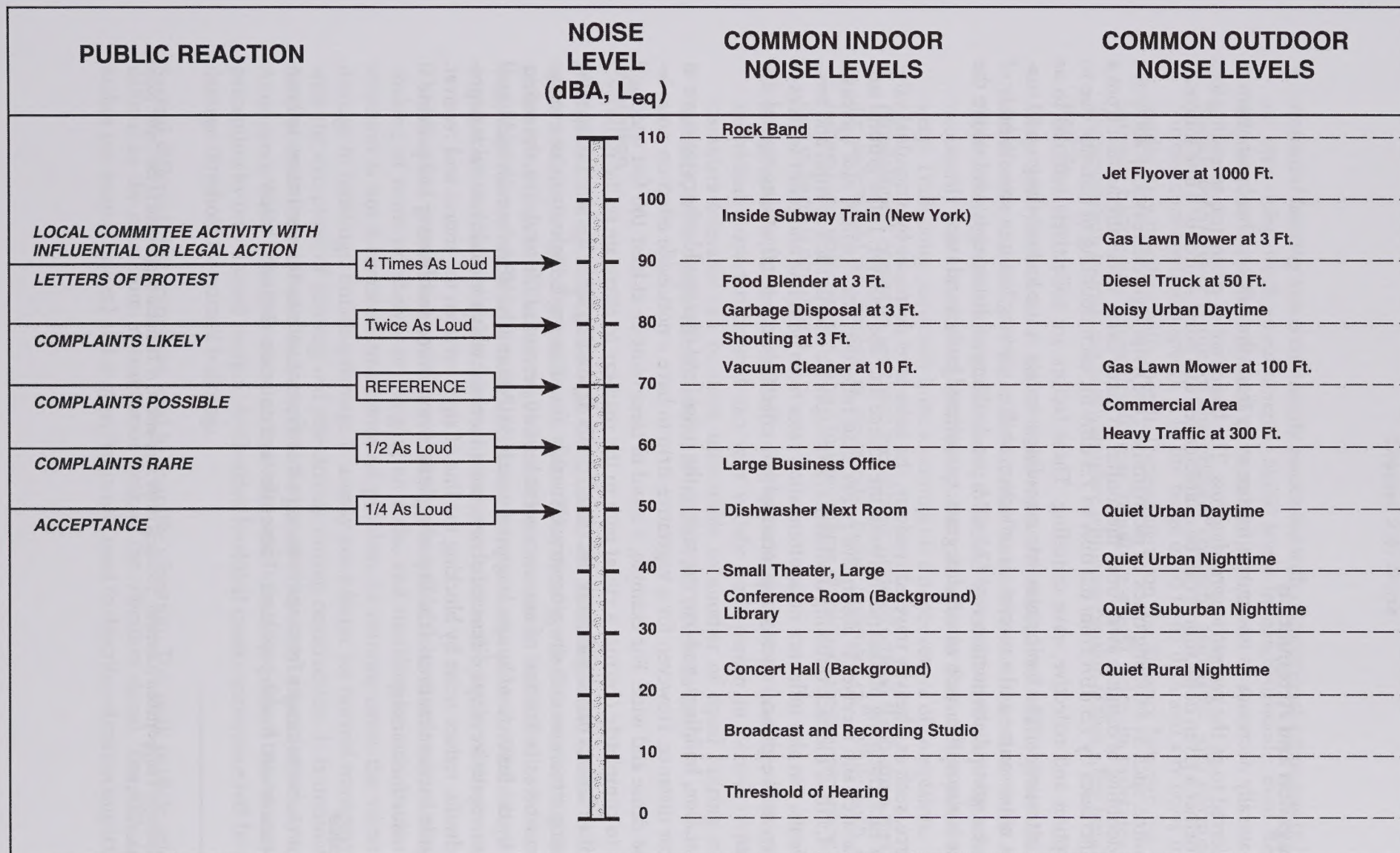
Environmental noise levels typically fluctuate over time; different types of noise descriptors are used to account for this variability. Some descriptors characterize cumulative noise over a given period, while others describe single noise events. The energy-equivalent noise level (L_{eq}), a cumulative noise descriptor, is the actual time-averaged, equivalent steady-state sound level, which, in a stated period, contains the same acoustic energy as the time-varying sound level during the same period. Some representative noise sources and their corresponding A-weighted noise levels are shown in Figure 2.6-1.

Two other cumulative noise descriptors values, Day-Night Average Noise Level (DNL) and Community Noise Equivalent Level (CNEL), result from the averaging of L_{eq} values (based on A-

weighted decibels) over a 24-hour period, with weighting factors applied to different periods of the day to account for their greater relative annoyance. For DNL, noise that occurs during the nighttime period (10:00 p.m. to 7:00 a.m.) is penalized by 10 dBA. The CNEL descriptor is similar to DNL, except that it also includes a penalty of approximately 5 dBA for noise that occurs during the evening period (7:00 p.m. to 10:00 p.m.). Cumulative noise descriptors, DNL and CNEL, are well correlated with the likelihood of public annoyance from transportation noise sources.

Individual noise events, such as train passbys, are further described using single-event and cumulative noise descriptors. For single events, the maximum measured noise level ($L_{\max}$) is often cited, as is the Sound Exposure Level (SEL). The SEL is the energy-based sum of a given-duration noise event squeezed into a reference-duration of one second.

The L_{eq} for the loudest hour is used by the FHWA and Caltrans to assess traffic noise impacts. L_{eq} is used by most jurisdictions for limits on noise generated from one property to another for construction noise. CNEL is used by most local jurisdictions for noise-land use compatibility standards, and by the State of California for interior noise standards.



Source: Caltrans Transportation Laboratory Noise Manual, 1982; and
Modification by Environmental Science Associates, 2001.

Figure 2.6-1
Noise Effects on People

Sound Propagation and Attenuation

Sound level naturally decreases as one moves further away from the source. This basic attenuation rate is referred to as the *geometric spreading loss*. The basic rate of geometric spreading loss depends on whether a given noise source can be characterized as a point source or a line source.

For a point source, such as an idling truck or jackhammer, the noise level decreases by about 6.0 dBA for each doubling of distance away from the source. In many cases, noise attenuation from a point source increases by 1.5 dBA from 6.0 dBA to 7.5 dBA for each doubling of distance due to ground absorption and reflective wave canceling. These factors are collectively referred to as *excess ground attenuation*. The basic geometric spreading loss rate is used where the ground surface between a noise source and a receiver is reflective, such as parking lots or a smooth body of water. The excess ground attenuation rate (7.5 dBA per doubling of distance) is used where the ground surface is absorptive, such as soft dirt, grass, or scattered bushes and trees.

For a line source, such as a heavily traveled roadway, the noise level decreases by a nominal value of 3.0 dBA for each doubling of distance between the source and the receiver. If the ground surface between source and receiver is absorptive rather than reflective, the nominal rate increases by 1.5 dBA to 4.5 dBA for each doubling of distance. Atmospheric effects, such as wind and temperature gradients, can also influence noise attenuation rates from both line and point sources of noise. However, unlike ground attenuation, atmospheric effects are constantly changing and difficult to predict.

Trees and vegetation, buildings, and barriers reduce the noise level that would otherwise occur at a given receptor distance. However, for a vegetative strip to have a noticeable effect on noise levels, it must be dense and wide. For example, a stand of trees must be at least 100 feet wide and dense enough to completely obstruct a visual path to the roadway to attenuate traffic noise by 5 dBA.¹ A row of structures can shield more distant receivers depending upon the size and spacing of the intervening structures and site geometry. Generally, for an at-grade highway in an average residential area where the first row of houses cover at least 40 percent of the total area, the reduction provided by the first row of houses is approximately 3 dBA, and 1.5 dBA for each additional row.² Similar to vegetative strips discussed above, noise barriers, which include natural topography and soundwalls, reduce noise by blocking the line of sight between the source and receiver. Generally, a noise barrier that breaks the line of sight between source and receiver will provide at least a 5-dBA reduction in noise.

Effects of Noise

Human reaction to noise ranges from annoyance, to interference with various activities, to hearing loss and stress-related health problems. These effects of noise are discussed below:

¹ California Department of Transportation (Caltrans), Technical Noise Supplement, A Technical Supplement to the Traffic Noise Analysis Protocol, October 1998.

² Ibid.

- **Potential hearing loss** is commonly associated with occupational exposures in heavy industry or very noisy work environments. Noise levels in neighborhoods, even near very noisy airports, are not sufficiently loud to cause hearing loss.
- **Speech interference** is one of the primary concerns associated with environmental noise. Normal conversational speech is in the range of 60 to 65 dBA and any noise in this range or louder may interfere with speech. Depending upon the distance between the talker and the listener, background noise levels may require a raised voice in order to communicate. Transportation sources can easily interfere with conversation within a few hundred feet of the source.
- **Sleep interference** is a major noise concern related to traffic-generated noise. Sleep disturbance studies have identified interior noise levels attributed to traffic noise as a key factor of sleep disturbance. However, it should be noted that sleep disturbance does not necessarily mean awakening from sleep, but can refer to altering the pattern and stages of sleep. Train noise (especially horn soundings) is a major source of complaints.
- **Physiological responses** are those measurable noise effects on the human metabolism. They are ascertained as changes in pulse rate, blood pressure, etc. While such effects can be induced and observed, the extent to which these physiological responses cause harm or are a sign of harm is not known.
- **Annoyance** is the most difficult of all noise responses to describe. Annoyance is a very individual characteristic and can vary widely from person to person. What one person considers tolerable can be quite unbearable to another of equal hearing capability. (For instance, some people like the sound of trains, while others do not.)

Vibration

Vibration is energy radiated through the ground. The rumbling sound caused by the vibration of room surfaces is called groundborne noise. Sources of groundborne vibration include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or human-made causes (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, such as factory machinery, or transient, such as the passby of a train or an explosion.

The effects of groundborne vibration include perceptible floor movement, rattling of windows, shaking of items on shelves or hanging on walls, and rumbling sounds. In contrast to noise, vibration is not a common environmental problem. In extreme cases, the vibration can cause damage to buildings. Building damage is usually not a factor for normal transportation projects, with the exception of blasting and pile driving during construction. It is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads. Annoyance from vibration often occurs when the vibration exceeds the threshold of human perception by only a small margin. A vibration level that causes annoyance will be well below the damage threshold for normal buildings.

Several different descriptors are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is expressed in inches per second (in/sec) and is most frequently used to describe vibration impacts to buildings.

The root mean square (RMS) amplitude is most frequently used to describe the effect of vibration on the human body. This is because the human body responds to the average vibration amplitude rather than the peak. The RMS amplitude is defined as the average of the squared amplitude of the signal, typically calculated over a 1-second period. As with airborne sound, the RMS velocity is often expressed in decibel notation, as vibration decibels (VdB). The decibel notation acts to compress the range of numbers required to describe vibration.

Sensitive Receptors

People in residences, motels and hotels, schools, libraries, churches, hospitals, nursing homes, auditoriums, natural areas, parks and outdoor recreation areas are generally more sensitive to noise than are people at commercial and industrial establishments. Consequently, the noise standards for sensitive land uses are more stringent than for those at less sensitive uses. Sensitive receptors of all types are located within the Transportation 2035 Plan travel corridors.

To protect various human activities in sensitive areas (e.g., residences, schools, and hospitals), lower noise levels are generally required. For example, a maximum outdoor noise level of 55 to 60 DNL is necessary for intelligible speech communication inside a typical home. Social surveys and case studies have shown that complaints and community annoyance in residential areas begin to occur when outdoor noise reaches 55 DNL.³ Sporadic complaints associated with the 55 to 60 DNL range give rise to widespread complaints and sometimes individual threats of legal action within the 60 to 70 DNL range. At 70 DNL and above, residential community reaction typically involves threats of legal action and strong appeals to local officials to stop the noise.

Existing Noise Sources

Principal Bay Area noise sources are airports, freeways, arterial roadways, port facilities, and railroads. Additional noise generators include industrial manufacturing plants and construction sites. Local collector streets are not considered to be a significant source of noise since traffic volume and speed are generally much lower than for freeways and arterial roadways. Generally, transportation-related noise sources dominate and characterize the ambient noise environment of urban areas.

Airports

The Bay Area airport system consists of a total of 25 airport facilities, including 4 commercial service airports, 19 general aviation airports, and 2 military airports.⁴ Airport operation, particularly the large commercial service airports play a significant role in the noise environment of many Bay Area communities. Bay Area airport system development is addressed regionally in the *Regional Airport System Plan* (RASP) and locally in individual airport master plans. The airport master plans address community noise issues near airports.

³ U.S. Environmental Protection Agency, *Noise Effects Handbook*, July 1981.

⁴ Regional Airport Planning Committee, *Regional Airport System Plan – General Aviation Element*, Final Report, June 2003.

Noise impacts from general aviation are significantly different from those associated with larger air carrier aircraft. Therefore, airport noise, both close to the airport runways and farther away at higher altitudes, is affected to some extent by the type of aircraft using the airports. One notable difference is that the typical piston engine general aviation aircraft sounds different from commercial jets. Commercial air carrier airports tend to have straight in and straight out approach paths at low approach angles. General aviation airports have straight in and straight out flight paths typically at higher approach angle, as well as rectangular shaped flight tracks used primarily for pilot training and practice. Aircraft using this rectangular shaped flight track typically generate noise levels below established noise standards, but a single aircraft may use the same track many times during a one-hour practice session. Airports with a substantial level of pilot training activity have a high percentage of operations along these rectangular flight tracks.

Individual airports have attempted to mitigate noise impacts on surrounding communities by instigating various operational procedures to avoid the most noise sensitive areas, to the extent permitted by FAA regulations.

Freeways, Expressways and Arterial Roadways

The Bay Area has approximately 1,420 directional miles of freeways and state highways.⁵ Noise from vehicle traffic on roadways varies throughout the day based on the average density of noise sources in a given area. Individual vehicle noise is a combination of the noise produced by the engine, exhaust, and tires. Defective mufflers or other faulty equipment on vehicles can also increase the loudness of traffic noise. Any condition (such as a steep incline) that causes heavy laboring of motor vehicle engines will also increase traffic noise levels.

Traffic noise at a particular location depends upon the traffic volume on the roadway, the average vehicle speed, distance between the receptor and the roadway, the presence of intervening barriers between source and receiver, and the ratio of trucks (particularly heavy trucks) and buses to automobiles. As one moves away from a roadway, traffic noise levels are reduced by distance, terrain, vegetation, and natural and manmade obstacles. Traffic noise is not usually a serious problem for people who live more than 500 feet from heavily traveled freeways or more than 100 to 200 feet from lightly traveled roads.

Various factors control how traffic noise levels affect nearby sensitive land uses. These factors include: roadway elevation compared to grade; structures or terrain intervening between the roadway and the sensitive receptors; and the distance between the roadway and receptors. For example, measurements show that depressing a freeway by approximately 12 feet yields a reduction in traffic noise relative to an at-grade freeway of 7 to 10 dBA at all distances from the freeway.⁶ Traffic noise from an elevated freeway is typically 2 to 10 dBA lower than an equivalent at-grade facility within 300 feet of the freeway. However, beyond 300 feet, the noise radiated by an elevated and at-grade freeway (assuming equal traffic volumes, truck mix, and vehicle speed) is the same.⁷

⁵ Metropolitan Transportation Commission, 2008.

⁶ Beranek, Leo L., Noise and Vibration Control, 1988.

⁷ Beranek, Leo L., Noise and Vibration Control, 1988.

Caltrans or other sponsors of freeway projects conduct detailed noise studies for their environmental documents prior to implementation.

The Bay Area has an enormous number of arterial roadways. Typical arterial roadways have one or two lanes of traffic in each direction, with some containing as many as four lanes in each direction. Noise from these sources can be a significant environmental concern where buffers (e.g., buildings, landscaping, etc.) are inadequate or where the distance from centerline to sensitive uses is relatively small. Given typical daily traffic volumes of 10,000 to 40,000, noise levels along arterial roadways typically range from DNL 65 to 70 dBA at a distance of 50 feet from the roadway centerlines. In some cases, traffic noise is so pervasive that it can depress property values for residential uses. Project sponsors for new or widened arterials conduct detailed noise analyses for these projects as part of their environmental documents when these projects are ready for implementation.

Railroad Operations

The two basic types of railroad operations are freight trains and passenger rail, the latter consisting of commuter and intercity passenger trains and steel-wheel urban rail transit. Generally, freight operations occur at all hours of the day and night, while passenger rail operations are concentrated within the daytime and evening periods.

Trains can generate high, relatively brief, intermittent noise events. Train noise is an environmental concern for sensitive uses located along rail lines and in the vicinities of switching yards. Locomotive engines and the interaction of steel wheels and rails generate primary rail noise. The latter source creates three types of noise: 1) rolling noise due to continuous rolling contact; 2) impact noise when a wheel encounters a rail joint, turnout or crossover; and 3) squeal generated by friction on tight curves. For very high-speed rail vehicles, air turbulence can be a significant source of noise.⁸

Train air horns and crossing bell gates contribute to loud noise levels near grade crossings. Table 2.6-1 provides reference noise levels in terms of Sound Exposure Levels (SEL) for different types of rail operations. SEL is equivalent to the total sound measure for a single event.

⁸ U.S. Department of Transportation, Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, May 2006.

Table 2.6-1: Reference Noise Levels for Various Transit Rail Operations

Source/Type		Reference Conditions	Reference Noise Level (SEL) ¹
Commuter Rail, At-Grade	Locomotives	Diesel-Electric, 3,000 horsepower, throttle 5	92
		Electric	90
	Cars	Ballast, welded rail	82
Rail Transit		At-grade, ballast, welded rail	82
Automated	Steel wheel	Aerial, concrete, welded rail	80
Guideway Transit	Rubber tire	Aerial, concrete guideway	78
Monorail		Aerial straddle beam	82
Maglev		Aerial, open guideway	72

a. Measured at 50 feet from track centerline with trains operating at 50 miles per hour. For the sake of comparison, an automobile passby event generates an SEL of approximately 73 dBA, and a city bus generates an SEL of approximately 84 dBA.

Source: U.S. Department of Transportation, Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, May 2006

Freight Trains

Freight trains are a source of environmental noise at some locations in the Bay Area. Freight train noise consists of locomotive engine sound and rail car wheel-rail interaction. The former depends on track grade conditions (i.e., uphill versus downhill) and is largely independent of speed whereas the latter is highly speed dependent, increasing approximately 6 dB for each doubling of train velocity. Noise levels and duration also vary depending on the length of the freight train

In addition to noise, freight trains also generate substantial ground-borne vibration near the tracks. Ground-borne noise and vibration is a function of quality of the track and the operating speed of the vehicles. (Improvements to private railroad rights of way for freight operations are not part of the proposed Transportation 2035 Plan).

Commuter and Intercity Passenger Trains

In the Bay Area, there are four commuter and intercity passenger train operators: Caltrain, Capitol Corridor, ACE, and AMTRAK. Passenger trains can be powered by diesel or electric locomotives, with the electric motors being comparatively quiet. Noise from local and regional passenger trains is primarily from diesel engines and train horns.

In general, the noise generated by commuter rail facilities (powered by either diesel or electric locomotives) is from the locomotives themselves and the use of train horns. Typical commuter train passby events of 15 during the day and 3 during the night with each train consisting of a locomotive and eight cars generate approximately DNL 78 dBA at 50 feet with horn and approximately DNL 60 dBA at 50 feet without sounding of horns.

Heavy and Light Rail Transit

Heavy rail is generally defined as electrified rapid transit trains with dedicated guideway, and light rail as electrified transit trains that do not require dedicated guideway. In general, noise

increases with speed and train length, and is most problematic within 50 feet of the track. BART trains, operating at- or above-grade, typically generate noise levels of about 70 DNL at a distance of 100 feet from the tracks. The DNL drops to about 60 dBA at a distance of 400 feet.

Light rail noise levels vary, depending upon vehicle speed, number of cars per train, and whether the trains operate on embedded or tie-and-ballast trackway. The distance to the 60 DNL contour for light rail is typically 100 to 150 feet from the tracks.

Construction Noise Sources

Construction can be another significant, although typically short-term, source of noise. Construction is most significant when it takes place near sensitive land uses and occurs at night or in early morning hours. As discussed above, local governments typically regulate noise associated with construction equipment and activities through enforcement of noise ordinance standards, implementation of general plan policies, and imposition of conditions of approval for building or grading permits. Table 2.6-2 shows typical noise levels associated with various types of construction related machinery.

The noise levels generated by construction equipment vary greatly depending on factors such as the type of equipment, the specific model, the operation being performed, and the condition of the equipment. The equivalent sound level (L_{eq}) of the construction activity also depends on the fraction of time that the equipment is operated over the time period of construction. The dominant construction equipment noise source is usually a diesel engine, without sufficient muffling. In a few cases however, such as impact pile driving or pavement breaking, process noise dominates. Stationary equipment operates in one location for one or more days at a time, with either a fixed-power operation (pumps, generators, compressors) or a variable noise operation (pile drivers, pavement breakers). Mobile equipment moves around the construction site with power applied in cyclic fashion (bulldozers, loaders), or to and from the site (trucks). Construction-related noise levels generally fluctuate depending on the construction phase, equipment type and duration of use, distance between noise source and receptor, and presence or absence of barriers between noise source and receptor.

Table 2.6-2: Typical Noise Levels from Construction Equipment

Construction Equipment	Noise Levels (dBA at 50 feet from source)
Air Compressor	81
Backhoe	80
Ballast Equalizer	82
Ballast Tamper	83
Compactor	82
Concrete Mixer	85
Concrete Pump	82
Concrete Vibrator	76
Crane, Derrick	88
Crane, Mobile	83
Dozer	85
Generator	81
Grader	85
Impact Wrench	85
Jack Hammer	88
Loader	85
Paver	89
Pile-Driver (Impact)	101
Pile-Driver (Sonic)	96
Pneumatic Tool	85
Pump	76
Rail Saw	90
Rock Drill	98
Roller	74
Saw	76
Scarifier	83
Scraper	89
Shovel	82
Spike Driver	77
Tie Cutter	84
Tie Handler	80
Tie Inserter	85
Truck	88

Source: U.S. Department of Transportation, Federal Transit Administration, Transit Noise and Vibration Impact Assessment, May 2006

REGULATORY SETTING

Federal, state and local agencies regulate different aspects of environmental noise. Generally, the federal government sets noise standards for transportation-related noise sources closely linked to interstate commerce. These include aircraft, locomotives, and trucks. The state government sets noise standards for those transportation noise sources such as automobiles, light trucks, and motorcycles. Noise sources associated with industrial, commercial, and construction activities are generally subject to local control through noise ordinances and general plan policies. Local general plans identify general principles intended to guide and influence development plans, and noise ordinances set forth the specific standards and procedures for addressing particular noise sources and activities.

Federal Regulations

Railroads

Federal regulations for railroad noise are contained in 40 CFR, Part 201 and 49 CFR, Part 210. Noise limits are implemented through regulatory controls on locomotive manufacturers. For locomotives manufactured during or after 1980, noise limits are as follows:

- Stationary locomotives (at idle throttle setting) are not to exceed 70 dBA at 15 meters (approximately 50 feet) from the track pathway centerline;
- Stationary locomotives (at all other throttle settings) are not to exceed 87 dBA at 15 meters; and
- Moving locomotives are not to exceed 90 dBA at 15 meters.

Sounding locomotive horns or whistles in advance of highway-rail grade crossings has been used as a safety precaution by railroads since the late 1880s. The manner in which horns have been sounded (two longs, one short and one long) was standardized in 1938. In response to a growing national trend towards restrictions on the use of locomotive horns under local ordinances and a related increase in collisions, Congress passed the Swift Rail Development Act, which directed the Federal Railroad Administration to develop rules addressing this issue. On December 18, 2003, the Federal Railroad Administration published an Interim Final Rule that requires the use of locomotive horns or whistles when approaching road/rail grade crossing, except in approved quiet zones, where supplementary safety measures have been installed or adopted by the state or locality. The rule establishes that a horn sound level must be a minimum of 96 dBA and no louder than 110 dBA measured 100 feet in front of the locomotive and 15 feet above the rail. The rule became effective on December 18, 2004.⁹

Transit

The Federal Transit Administration (FTA) provides capital assistance for a wide range of mass transit projects— from completely new rail rapid transit systems to bus maintenance facilities and

⁹ Federal Railroad Administration, *Federal Register*, December 18, 2003.

vehicle purchases. The extent of environmental analysis and review will depend on the scope and complexity of the proposed project and the associated environmental impacts. According to the FTA Noise and Vibration Impact Assessment Manual (May 2006), At the comprehensive transportation planning stage (this program EIR) “environmental effects are usually considered on a broad scale, for example, overall development patterns, impact on green space, and regional air quality. Noise and vibration assessments are not typically done at the systems planning stage since the proposed infrastructure improvements lack the necessary detail.”

Interstate Highways and Trucks

Under regulations established by the Federal Highway Administration (FHWA), noise abatement must be considered for federal or federally-funded projects involving the construction of a new highway or significant modification of an existing freeway. Abatement is considered when the project would result in a substantial noise increase or when the predicted noise levels approach or exceed the Noise Abatement Criteria (23 CFR Part 772).

Caltrans uses the FHWA Noise Abatement Criteria (NAC) to evaluate noise impacts. The NAC are based upon noise levels associated with interference of speech communication and they are a compromise between noise levels that are desirable and those that are achievable. The NAC should only be used as absolute values which, when approached or exceeded, require the consideration of traffic noise abatement measures. The FHWA NAC (hourly A-weighted sound level in decibels) are:

- **Activity Group A: 57 dBA (Exterior):** Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose;
- **Activity Group B: 67 dBA (Exterior):** Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals;
- **Activity Group C: 72 dBA (Exterior):** Developed lands, properties, or activities not included in Categories A or B above;
- **Activity Group D: No Criteria:** Undeveloped lands; and
- **Activity Group E: 52 dBA (Interior):** Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

The Caltrans Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Barrier Projects (Protocol) provides standards and procedures for traffic noise impact analysis on Caltrans projects. According to the Protocol, “A noise level is considered to approach the NAC for a given activity category if it is *within 1 dBA (A-weighted decibel) of the NAC*. A substantial noise increase occurs when the project’s predicted worst hour design-year noise level exceeds the existing worst-hour noise level by 12 dBA- $L_{eq}(h)$ (1-hour equivalent sound level) or more”(emphasis added).

The Federal truck passby noise standard is 80 dBA at 15 meters from the vehicle pathway centerline (trucks more than 4.5 tons, gross vehicle weight rating, under 40 CFR, Part 205, Subpart B). This standard is implemented through regulatory controls on truck manufacturers.

State Regulations

Roads

The State of California establishes noise limits for vehicles licensed to operate on public roads. As described above, Caltrans uses FHWA criteria for highways. For heavy trucks, the passby standard is consistent with the federal limit of 80 dBA. The State passby standard for light trucks and passenger cars (less than 4.5 tons, gross vehicle rating) is also 80 dBA at 15 meters from the centerline.¹⁰ These controls are implemented through controls on vehicle manufacturers and by legal sanction of vehicle operators by state and local law enforcement officials.

Airports

The State of California has the authority to establish regulations requiring airports to address aircraft noise impacts on land uses in their vicinities. The State of California's Airport Noise Standards, found in Title 21 of the California Code of Regulations, identify a noise exposure level of CNEL 65 dBA as the noise impact boundary around airports. All land uses within the noise impact boundary are required to ensure that they are compatible with the aircraft noise environment.

Other Land Uses

The State of California has also established noise insulation standards for new multi-family residential units, hotels, and motels that would be subject to relatively high levels of transportation-related noise. These requirements are collectively known as the California Noise Insulation Standards and are found in *California Code of Regulations*, Title 24. These standards set forth an interior standard of 45 DNL in any habitable room. It requires an acoustical analysis demonstrating building design to meet this interior standard where the project site is subject to noise levels greater than 60 DNL. Title 24 standards are typically enforced by local jurisdictions through the building permit process.

Local Regulations

To identify, appraise, and remedy noise problems in the local community, each county and city in the Bay Area is required to adopt a Noise Element as part of its General Plan. Each Noise Element is required to analyze and quantify, to the extent practicable, current and projected noise levels associated with local noise sources. These sources include, but are not limited to, highways and freeways, primary arterials and major local streets, rail operations, air traffic, local industrial plants, and other stationary sources that contribute to the community noise environment.

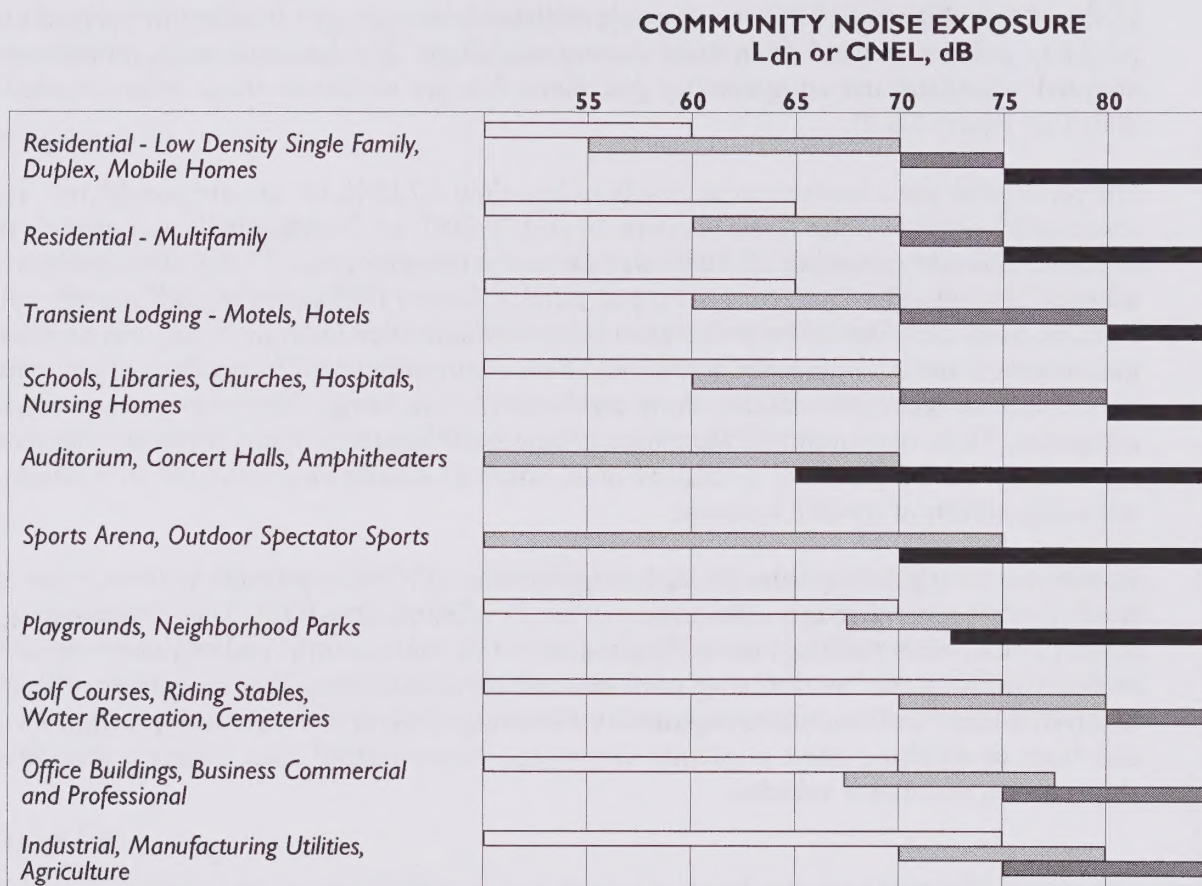
¹⁰ California Vehicle Code, Section 23130 and 23130.5; 27150, *et seq.*; 27204 and 27206.

Beyond statutory requirements, local jurisdictions are free to adopt their own goals and policies in their Noise Elements. However, most jurisdictions have chosen to adopt noise/land use compatibility policies derived from State recommendations. For instance, most jurisdictions have adopted noise/land use compatibility guidelines that are similar to those recommended by the State (see Figure 2.6-2).

For residential uses, outdoor noise levels of less than 60 DNL or less are considered "normally acceptable"; outdoor noise levels between 60 and 70 DNL are "conditionally acceptable"; and outdoor noise levels exceeding 70 DNL are "normally unacceptable." Under State guidelines, new schools, libraries, churches, hospitals, and nursing homes that are proposed in areas subject to DNL 60 to 70 dBA should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. For many land uses, the State recommendations show overlapping DNL ranges for two or more compatibility categories. These overlapping DNL ranges indicate that local conditions (existing noise levels and community attitudes toward dominant noise sources) should be considered in evaluating land use compatibility at specific locations.

In addition to regulating noise through implementation of noise element policies, local jurisdictions regulate noise through enforcement of local ordinance standards. These standards generally relate to noisy activities (e.g., use of loudspeakers and construction) and stationary noise sources and facilities (e.g., air conditioning units and industrial activities); they also may address airport and traffic noise and land use compatibility. Generally, federal and state laws preempt local agencies from establishing noise standards for transportation-related noise sources, such as aircraft, ships, trains, and motor vehicles.

Noise and Land Use Compatibility Matrix Guidelines



INTERPRETATION:



NORMALLY ACCEPTABLE

Specified land use is satisfactory, based upon the assumption that any building involved is of normal conventional construction, without any special noise insulation requirements.



CONDITIONALLY ACCEPTABLE

New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.



NORMALLY UNACCEPTABLE

New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.



CLEARLY UNACCEPTABLE

New construction or development should generally not be undertaken.

IMPACT ANALYSIS

SIGNIFICANCE CRITERIA

Implementation of the Transportation 2035 Plan would have a potentially significant adverse impact if Plan projects would result in:

- Criterion 1:** Exposure of persons to or generation of construction noise levels and ground-borne vibration in excess of standards established in the applicable local general plan or noise ordinance standards (addresses temporary or periodic increases).
- Criterion 2:** Highway noise levels or groundborne vibration that approach or exceed the FHWA Noise Abatement Criteria or increase substantially compared to the No Project alternative and existing conditions. A 3 dBA change would be considered substantial, and is typically caused by a doubling of traffic on the roadway.
- Criterion 3:** Transit noise levels or groundborne vibration that increase by more than the allowable noise exposure permitted under the Federal Transit Administration (FTA) criteria, as shown in the table below.

Table 2.6-3: Noise Impact Criteria: Effect on Cumulative Noise Exposure

<i>DNL or Leq in dBA (rounded to nearest whole decibel)</i>			
<i>Existing Noise Exposure</i>	<i>Allowable Project Noise Exposure</i>	<i>Allowable Combined Total Noise Exposure</i>	<i>Allowable Noise Exposure Increase</i>
45	51	52	7
50	53	55	5
55	55	58	3
60	57	62	2
65	60	66	1
70	64	71	1
75	65	75	0

Source: U.S. Department of Transportation, Federal Transit Administration, Transit Noise and Vibration Impact Assessment. May 2006

METHOD OF ANALYSIS

Since noise is a highly localized impact, specific and detailed analyses are most appropriate at the project level. Nonetheless, this programmatic assessment of the Transportation 2035 Plan attempts to determine the potential for significant noise impacts based on general project features such as the type of project, location, and surrounding land uses. Because traffic noise is never constant, statistical descriptors are almost always used as a single number to describe varying traffic noise levels. For the proposed project, L_{eq} is used as the noise descriptor for analysis (L_{eq} is described in more detail at the beginning of the chapter). Based on Federal Highway Administration (FHWA) guidance, noise impacts occur when predicted noise levels increase

substantially when compared to existing levels, or when noise levels approach or exceed the FHWA's noise abatement criteria (NAC).

Traffic noise level predictions were made for the entire modeled roadway network (freeways, expressways, and arterials) using the FHWA Noise Prediction Model adjusted to reflect California Vehicle Noise (Calveno) Reference Energy Mean Emissions Levels developed by Caltrans. For this modeling effort, average weekday p.m. peak hour traffic volumes and speeds were used (these volumes include all projected traffic on the roadways, including buses and trucks). Estimated noise levels correspond to a distance of 100 feet from the centerline of the roadway. The modeling effort looked at directional miles and added 3 dBA to the calculated noise level to account for traffic traveling in the opposite direction for a given roadway segment. This approach conservatively doubles the traffic vehicle volumes for noise estimation purposes. The analysis does not define surrounding land uses or assume any local standards that prohibit sensitive receptors near traffic noise. Hence, this conservative assessment assumes that sensitive receptors could be located within 100 feet of the roadway centerline for all modeled roadway segments.

To evaluate the Transportation 2035 Plan, the base year (2006) condition was compared with the 2035 No Project and 2035 Project scenarios.

First, the analysis reports the potential for absolute noise impacts. Following guidance published by Caltrans and the FHWA, a roadway noise impact is determined to occur if projected noise levels approach the NAC for noise sensitive land uses by 1 dBA. 66 dBA is the threshold used as it is 1 dBA below the FHWA threshold for Activity Group B, which encompasses virtually all the relevant and sensitive land uses that are near roadways in the Bay Area. The analysis estimates the number of roadway miles under each scenario where noise levels would be equal to or greater than 66 dBA at a distance of 100 feet from the centerline of the roadway.

Second, the analysis reports to what extent the proposed Project and the No Project Alternative would cause a relative increase in roadway noise level of 3 dBA or more from the base year (2006) condition.

Third, a qualitative comparison is made between existing conditions and anticipated future transit noise and groundborne vibration. However, due to the programmatic level of analysis, the potential impact cannot be quantified and compared to FTA noise exposure criteria.

SUMMARY OF IMPACTS

Direct Impacts

Implementation of transportation improvements in the Transportation 2035 Plan could result in both short- and long-term impacts on noise levels in the study area. In addition, area wide growth in traffic could result in cumulative noise impacts in some locations, depending on the local setting.

Short Term Impacts

Many of the transportation improvements in the Transportation 2035 Plan would entail construction, often using heavy equipment. Depending on the proximity of such activities to noise sensitive uses and the presence of intervening barriers, construction activities associated with individual projects could generate localized, short term noise impacts from excavation, grading, hauling, concrete pumping, and a variety of other activities requiring the operation of heavy equipment. In these cases, construction of individual projects could cause exposure of persons to or generation of noise levels in excess of standards established in the applicable local general plan or noise ordinance standards.

Long Term Impacts

Numerous Transportation 2035 Plan projects have been identified as having potentially significant operational local noise impacts, either from vehicle or rail travel. Direct impacts could result from new transit lines or increased frequency of service on existing lines (noise and groundborne vibration); widening of freeways, expressways, or arterials which brings noise closer to sensitive land uses; or addition of new lanes that result in higher traffic volumes and speeds.

Indirect/Cumulative Impacts

Proposed Transportation 2035 Plan projects, combined with projected population and employment growth and commensurate increase in regional trips, as well as implementation of regional and local land use policies and plans, could produce cumulatively considerable and unavoidable noise impacts in some areas due to the localized nature and community perceptions of noise.

IMPACTS AND MITIGATION MEASURES

Impact

2.6-1 Construction of the proposed Transportation 2035 Plan projects would have short-term noise impacts on surrounding areas. (*Less than Significant*)

Construction noise mitigation normally required by Caltrans' Standard Specifications and Standard Special Provisions, as well as local city and county ordinances would be implemented for individual Transportation 2035 Plan projects that include physical construction activities. Construction standards generally limit construction activities to times when construction noise would have the least effect on adjacent land uses, and would require such measures as properly muffling equipment noise, locating equipment as far from sensitive receptors as possible, and turning off equipment when not in use. Some jurisdictions may also have property line or other noise level limits that must be adhered to during construction.

Though it is not expected that these standards would eliminate all construction-related noise since complete mitigation may not be possible for certain projects, such as those that require pile driving and those in close proximity to sensitive receptors; nonetheless, implementation of

existing construction noise standards should be sufficient to reduce the potential impact of construction noise to a level that is less than significant.

Mitigation Measures

None required.

Impact

2.6-2 Transportation 2035 Plan projects could result in noise levels that approach or exceed the FHWA Noise Abatement Criteria or could cause noise levels to increase by 3 dBA or more when compared to existing conditions. (*Significant, mitigable*)

Table 2.6-4 identifies the total roadway miles of potentially affected roadways (freeways, expressways, and arterials) that would result in noise levels exceeding 66 dBA for each county and the Bay Area as a whole for base year 2006, 2035 No Project, and 2035 Project (Transportation 2035 Plan) scenarios.

Nearly all freeway miles on the modeled roadway network already exceed 66 dBA under existing conditions. Relative to existing conditions, roadway noise levels along expressways would be most affected by implementation of the proposed Project. For the region as a whole, the Transportation 2035 Plan projects would increase by 4.4 percent the roadway miles that approach or exceed the FHWA Noise Abatement Criteria. However, in the No Project scenario, the relative increase in roadway miles exceeding the federal threshold is 5.6 percent over existing conditions. The percentage of arterials that meet the 66 dBA criterion would also increase under the future scenarios.

Table 2.6-5 identifies the total roadway miles, by roadway type, by county, and for the Bay Area as a whole, that are projected to experience increases of traffic noise equal to or greater than 3 dBA compared to existing conditions for the No Project and proposed Project condition. This table shows that the proposed Project increases noise significantly on about 13 percent of all regional roadways. The No Project alternative increases noise significantly on about 18 percent of all regional roadways. Therefore, the proposed Transportation 2035 Plan would result in less severe noise impacts than the No Project alternative.

Project sponsors are required to review and consider local land use policies (including noise ordinances and policies) in preparation of their project proposals and project-level EIRs, and local governments are responsible for long-term land use planning related to noise issues (the Noise Element described in the regulatory setting) and considering the appropriate location of sensitive receptors in relation to existing transportation corridors. Further, the State of California has Noise Insulation Standards in place to regulate new residential development. However, despite these sources of oversight and regulation, there is still the potential that the program of projects in the proposed Transportation 2035 Plan could create a significant change in the noise environment compared to existing conditions, particularly for uses that are already nearby and not insulated sufficiently to address the new level of noise.

Table 2.6-4: Roadway Directional Miles > 66 dBA NAC Level, and Total Directional Miles, by Roadway Type and County

County	Roadway Type	2006			Year 2035, No Project			Net Change From 2006			Year 2035, Project			Net Change From 2006		
		# over 66 dBA	Total	% over 66 dBA	# over 66 dBA	Total	% over 66 dBA	# over 66 dBA	Total	% over 66 dBA	# over 66 dBA	Total	% over 66 dBA	# over 66 dBA	Total	% over 66 dBA
San Francisco	Freeways	53	53	100.0%	53	53	100.0%	0	0	0.0%	55	55	100.0%	2	2	0.0%
	Expressways	2	2	100.0%	2	2	100.0%	0	0	0.0%	2	2	100.0%	0	0	0.0%
	Arterials	183	633	28.9%	236	635	37.2%	53	2	8.3%	228	633	36.0%	45	0	7.1%
San Mateo	Freeways	167	170	98.5%	168	170	99.2%	1	0	0.7%	168	170	99.0%	1	0	0.5%
	Expressways	29	31	92.0%	29	31	92.8%	0	0	0.8%	29	31	92.8%	0	0	0.8%
	Arterials	276	1,068	25.8%	371	1,068	34.7%	95	1	8.9%	360	1,070	33.6%	84	3	7.8%
Santa Clara	Freeways	325	328	99.2%	324	326	99.4%	-1	-2	0.2%	323	326	99.2%	-2	-2	-0.1%
	Expressways	190	233	81.8%	217	235	92.5%	27	2	10.8%	224	235	95.4%	34	2	13.7%
	Arterials	665	2,066	32.2%	921	2,077	44.3%	256	11	12.1%	877	2,083	42.1%	212	17	9.9%
Alameda	Freeways	304	304	100.0%	305	305	100.0%	1	1	0.0%	305	305	100.0%	1	1	0.0%
	Expressways	34	40	84.1%	36	40	90.7%	3	0	6.7%	41	45	91.2%	7	5	7.2%
	Arterials	618	1,805	34.2%	826	1,829	45.2%	209	24	11.0%	791	1,830	43.2%	174	25	9.0%
Contra Costa	Freeways	184	184	99.8%	184	184	99.8%	0	0	0.0%	184	184	99.8%	0	0	0.0%
	Expressways	18	27	65.1%	36	50	72.2%	18	23	7.1%	32	52	61.8%	14	24	-3.3%
	Arterials	467	1,548	30.2%	688	1,598	43.1%	221	51	12.9%	659	1,606	41.0%	192	59	10.8%
Solano	Freeways	172	174	99.0%	172	174	99.0%	0	0	0.0%	172	174	99.0%	0	0	0.0%
	Expressways	49	60	82.5%	52	64	82.0%	3	4	-0.4%	52	72	72.3%	3	12	-10.2%
	Arterials	167	734	22.7%	268	734	36.5%	101	0	13.7%	250	741	33.8%	83	7	11.0%
Napa	Freeways	24	24	100.0%	24	24	100.0%	0	0	0.0%	24	24	100.0%	0	0	0.0%
	Expressways	37	37	100.0%	37	37	100.0%	0	0	0.0%	37	37	100.0%	0	0	0.0%
	Arterials	81	484	16.7%	109	484	22.5%	28	0	5.8%	111	489	22.8%	30	5	6.0%
Sonoma	Freeways	132	132	100.0%	132	132	100.0%	0	0	0.0%	132	132	100.0%	0	0	0.0%
	Expressways	20	20	100.0%	20	20	100.0%	0	0	0.0%	20	20	100.0%	0	0	0.0%
	Arterials	351	1,153	30.4%	492	1,160	42.4%	142	7	12.0%	433	1,167	37.1%	83	14	6.7%
Marin	Freeways	77	77	100.0%	77	77	100.0%	0	0	0.0%	77	77	100.0%	0	0	0.0%
	Arterials	110	559	19.7%	135	559	24.1%	24	0	4.4%	124	559	22.1%	13	0	2.4%
Bay Area	Freeways	1,438	1,445	99.5%	1,439	1,444	99.6%	0	-1	0.1%	1,440	1,446	99.6%	2	1	0.0%
	Expressways	379	450	84.2%	430	479	89.8%	51	29	5.6%	437	494	88.5%	58	43	4.4%
	Arterials	2,918	10,050	29.0%	4,047	10,144	39.9%	1,129	95	10.9%	3,834	10,179	37.7%	916	130	8.6%
	Combined	4,735	11,945	39.6%	5,916	12,067	49.0%	1,181	122	9.4%	5,711	12,119	47.1%	976	174	7.5%

Source: Environmental Science Associates, 2008; Metropolitan Transportation Commission, 2008

Table 2.6-5: Roadway Directional Miles with Significant Increase in Noise Levels (> 3 dBA), Base Year 2006 to 2035 No Project and 2035 Project Scenarios

County	Roadway Type	Year 2035, No Project			Year 2035, Project		
		>3 dBA Increase	Total	% with >3 dBA increase	>3 dBA Increase	Total	% with >3 dBA increase
San Francisco	Freeways	3	53	6.0%	5	55	8.3%
	Expressways	0.4	2	28.3%	0	2	0.0%
	Arterials	81	633	12.9%	70	631	11.1%
San Mateo	Freeways	0.4	168	0.2%	0.3	168	0.2%
	Expressways	4	31	11.8%	1	31	4.6%
	Arterials	225	1,063	21.2%	177	1,063	16.7%
Santa Clara	Freeways	2	326	0.7%	2	326	0.7%
	Expressways	36	234	15.6%	100	234	42.7%
	Arterials	462	2,058	22.5%	345	2,059	16.7%
Alameda	Freeways	2	305	0.7%	2	305	0.7%
	Expressways	10	39	24.9%	3	39	7.4%
	Arterials	380	1,801	21.1%	270	1,801	15.0%
Contra Costa	Freeways	3	182	1.7%	8	182	4.4%
	Expressways	5	27	17.1%	5	27	17.1%
	Arterials	315	1,526	20.7%	272	1,525	17.8%
Solano	Freeways	2	174	1.0%	3	174	1.6%
	Expressways	10	62	16.7%	4	62	6.6%
	Arterials	119	732	16.3%	80	732	11.0%
Napa	Freeways	0	24	0.0%	0	24	0.0%
	Expressways	0	31	0.0%	0	31	0.0%
	Arterials	135	484	27.9%	69	484	14.2%
Sonoma	Freeways	0.5	132	0.4%	0.5	132	0.4%
	Expressways	0	20	0.0%	0	20	0.0%
	Arterials	219	1,153	19.0%	151	1,153	13.1%
Marin	Freeways	0.3	77	0.4%	1	77	0.9%
	Arterials	110	559	19.6%	30	559	5.4%
Bay Area	Freeways	14	1,439	0.9%	21	1,441	1.5%
	Expressways	65	447	14.6%	113	447	25.4%
	Arterials	2,047	10,008	20.5%	1,463	10,007	14.6%
	Combined	2,126	11,894	17.9%	1,597	11,895	13.4%

Source: Environmental Science Associates, 2008; Metropolitan Transportation Commission Model Outputs 2008

Mitigation Measures

As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce noise impacts that shall be considered by project sponsors and decision-makers may include, but are not limited to, those described below.

2.6(a) Adjustments to proposed roadway or transit alignments to reduce noise levels in noise sensitive areas. For example, below-grade roadway alignments can effectively reduce noise levels in nearby areas.

2.6(b) Techniques such as landscaped berms, dense plantings, reduced-noise paving materials, and traffic calming measures in the design of their transportation improvements.

2.6(c) Contributing to the insulation of buildings or construction of noise barriers around sensitive receptor properties adjacent to the transportation improvement.

As noted, the implementation of noise mitigation will, in some cases, more than offset the noise impacts of a particular transportation improvement. As a result, the Transportation 2035 Plan has the potential to bring noise abatement benefits to communities that currently experience noise problems resulting from existing traffic.

Implementation of these mitigation measures is expected to reduce potentially significant noise impacts to a less-than-significant level.

Impact

2.6-3 Implementation of the proposed Transportation 2035 Plan could result in increased noise and groundborne vibration related to transit operations. (Significant, mitigable)

With Transportation 2035 Plan investments prioritizing transit and programs to reduce single-occupancy vehicle trips, MTC's transportation model suggests that the proposed Project will result in substantial increases in transit ridership in 2035 with implementation of the proposed Project (an 88 percent increase in daily transit boardings). Some of this increase is due an 18 percent expansion in transit seat miles, representing new services such as eBART and increased headways for some existing transit lines. This increase in transit service and transit frequency is likely to result in more noise than existing conditions. While at the project-level this analysis could be more nuanced, it is not possible for this program-level analysis to quantify the potential increase in transit noise. As described in the regulatory setting, the FTA does not expect regional transportation plan environmental assessments to quantify transit noise. However, to be conservative, this program-level analysis of the entire Transportation 2035 Plan concludes that there remains the potential for a significant increase in transit noise and vibration due to the expansion of new transit services and the increase in frequency of existing services.

Mitigation Measures

As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce noise impacts that shall be considered by project sponsors and decision-makers may include, but are not limited to, those described below.

Mitigation measures 2.6(a) through 2.6(c) above are considered appropriate for bus transit noise impacts. In addition to those mitigation measures, the following additional measures are provided to reduce Impact 2.6-3 as it pertains to rail transit:

2.6(d) Design approaches to reduce noise and vibration impacts of rail transit, such as vibration isolation of track segments, use of continuously welded track to minimize wheel noise, resilient wheels, vehicle skirts, wheel truing, rail grinding, undercar absorption, or vehicle horn loudness and pitch adjustments.

2.6(e) Operational changes to reduce noise impacts of rail transit, such as assisting local jurisdictions in pursuing Quiet Zones.

Implementation of these mitigation measures, in addition to measures 2.6(a) through 2.6(c), is expected to reduce potentially significant transit noise and vibration impacts to a level that is less than significant.

Cumulative Impact

2.6-4 The proposed Transportation 2035 Plan, combined with traffic related to projected regional population and employment growth, could result in a cumulatively considerable increase in overall noise levels along some travel corridors. (*Significant Cumulative Impact, Contribution Cumulative Considerable*)

Projected population and employment growth throughout the region will result in new noise sources that will require mitigation. These noise sources will come from a variety of land use types including but not limited to: new residential uses, new commercial uses, new public outdoor uses, and redevelopment of vacant or underutilized land. For the most part, this new development will adhere to stricter noise abatement standards and criteria than older development as noise ordinances and insulation standards improve over time. However, the project-level mitigation may be inadequate to fully address the cumulative noise environment. It is in this context that the impact of future transportation noise may become considerable.

Except where transportation improvements individually warrant noise mitigation (as determined at the project level), increased noise from other nearby land uses, or from unanticipated changes in the use of the transportation facility (e.g. more or different traffic on a given stretch of road than that projected in this EIR), would not necessarily be mitigated. On the other hand, in corridors with fewer sensitive receptors, traffic increases and changes are less likely to produce

Chapter 2.6: Noise

significant impacts. Nonetheless, as this program level analysis cannot be sure of the location of all sensitive receptors in relation to all proposed Transportation 2035 Plan projects, and it cannot project with certainty the cumulative noise environment resulting from future changes in land use near transportation projects, it remains possible that the noise impact of the proposed Transportation 2035 Plan could be cumulatively significant for certain locations and communities. Furthermore, as the transportation system is a major component of the noise environment, the contribution of the proposed Project to the overall cumulative noise impact could be considerable.

Mitigation Measures

Mitigation measures 2.6(a) through 2.6(e) above help to reduce this cumulative impact. These mitigation measures, however, are not assumed to fully reduce the potentially significant cumulative noise to a less-than-significant level due to the uncertainty of the cumulative future noise environment, the localized nature of noise impacts, and community perceptions of noise. Therefore, despite implementing feasible mitigation measures, the overall cumulative noise impact of the Transportation 2035 Plan is identified as significant and unavoidable, and the contribution of the proposed Project to this cumulative impact remains potentially considerable.

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2.7 Geology and Seismicity

The Bay Area is characterized by numerous active and potentially active faults capable of producing seismic events. Nonetheless, it is also a very attractive region and continues to grow in population and employment and thus, exposing the region to a level of vulnerability from seismic events. Planning for transportation projects in the Bay Area typically includes an evaluation of seismic stability and identifying and mitigating risks when new and improved transportation infrastructure projects are developed.

This chapter analyzes the potential effects of the Bay Area regional geologic and seismic environment on the transportation improvements proposed in the Transportation 2035 Plan. In addition to regional geologic and seismic hazards, the potential effects of site specific hazards such as those risks associated with underlying geologic materials are also evaluated at a programmatic level.

ENVIRONMENTAL SETTING

PHYSICAL SETTING

The physical setting describes existing geology in the Bay Area, soils, faults, and other seismic and geologic hazards.

Geology

California is divided into 11 geologic regions, referred to as geomorphic provinces, which are defined by similar physical characteristics such as relief, landforms, and geology. The Bay Area is located primarily within the Coast Range geomorphic province, with eastern portions of Contra Costa and Solano Counties extending into the neighboring Great Valley geomorphic province.

Coast Range

The Coast Range geomorphic province extends 400 miles along the Pacific Coast, from Oregon south into Southern California. Independent and discontinuous northwest-trending mountain ranges, ridges, and intervening valleys are distinguishing features of the Coast Range geomorphic province and generally characterize the geologic setting of the San Francisco Bay region. San Francisco Bay, which was formed within a shallow, regional structural depression, is the predominant feature, separating smaller northern and southern mountain ranges. In the southern Bay Area, the Santa Cruz Mountains border San Francisco Bay on the west, while the Berkeley Hills, an extension of the Diablo Range, are to the east. Mount Diablo marks the northern end of the Diablo Range, which stretches 130 miles southward to the Kettleman Hills at the cusp of the San Joaquin Valley. The broad, low-relief Santa Clara and San Benito Valleys lie between the Santa Cruz Mountains and the Diablo Range. In the North Bay, the rugged, mountainous character of the Marin Peninsula is dominated by Mount Tamalpais (elevation 2,604 feet above sea level).

Much of the Coast Range province is composed of marine sedimentary and volcanic rocks that form the Franciscan Assemblage, located east of the San Andreas fault. The Franciscan Assemblage in this region of California is Jurassic- to Cretaceous-age (approximately 65 to 150 million years old) and consists primarily of greenstone (altered volcanic rocks), basalt, chert (ancient silica-rich ocean deposits), and sandstone that originated as ancient sea floor sediments. The region west of the San Andreas fault is underlain by a mass of basement rock known as the “Salinian Block.” This block contains igneous rocks,¹ Tertiary-age (up to 65 million years old) marine sandstone, and various metamorphic rocks² believed to have originated some 350 miles to the south. The Salinian Block has been moving northward along the west side of the San Andreas fault and associated rocks can be found as far north as Point Arena.

Marginal lands surrounding the San Francisco Bay consist generally of alluvial plains of low relief that slope gently bayward from the bordering uplands and foothills. The alluvial plains that comprise the Bay margin are composed of Quaternary-age (up to 2 million years old) alluvial sediments consisting of unconsolidated stream and basin deposits. These alluvial plains terminate bayward at the tidal marshlands that immediately surround the Bay. Marshlands are composed of intertidal deposits, including the fine-grained plastic clay known as “Bay Mud,” which, in some areas, underlies artificial fills. San Francisco Bay is originally believed to have encompassed 700 square miles, although dredging and fill operations have reduced the Bay to approximately 400 square miles. Historic shoreline reclamation projects beginning at the turn of the twentieth century resulted in the placement of varying types of man-made artificial fill that overlies intertidal deposits.

Great Valley

Portions of Solano and Contra Costa Counties are located in the Great Valley geomorphic province, which consists of a large, nearly level inland alluvial plain 400 miles in length and averaging 50 miles in width. The topography of the Great Valley is flat, but slopes gently along its eastern margin (Sierra Nevada foothills) and western margin (Coast Ranges). Sediments in the Great Valley are gravels, sands, clays, and silts that originated largely from the Sierras, with sediments from the Coast Range contributing to a lesser extent. The sediments that compose the valley floor are thick, and in some areas extend as far as 10 miles below the surface. The Great Valley Sequence, a thick section of ancient sea floor sediments extending under the Great Valley, overlies the Coast Range Franciscan Assemblage along the valley’s western flank.

Soils

A wide variety of soils form the alluvial plains bordering San Francisco Bay. Soils in the Bay Area fall within four major classifications established by the United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS). Depending on localized conditions, these general classifications are grouped into more specific soil types by location, climate, and

¹ Igneous rocks are those that form from molten magma, such as granite.

² Metamorphic rocks are sedimentary or volcanic rocks altered by prolonged heating and deformation.

slope. The Santa Clara valley and the alluvial plains surrounding San Francisco Bay are classified as deep alluvial plain and floodplain soils. These soils occupy the valleys in areas with higher rainfall and are considered productive when drained and fertilized. Soils closer to the Bay margin are generally dark-colored clays that have a high water table or are subject to overflow from flooding. Throughout California, Bay margin soils are typically used for wheat, barley, and native pastureland. Soils at the extreme edge of San Francisco Bay have a moderate to high content of soluble salts; these soils are referred to as “alkali soils” and can be used for salt grass pasture or for production of salt-tolerant crops. Soils in northern San Mateo County, the eastern portion of the city of San Francisco, and in Marin County are classified as residual soils and are characterized by moderate depth to underlying bedrock. Residual soils are present in natural grasslands where annual rainfall is considered moderately high; these grasslands constitute some of the best natural grazing lands in California.³

Seismicity

The San Francisco Bay Area is considered a region of high seismic activity with numerous active and potentially active faults capable of producing significant seismic events.⁴ The U.S. Geological Survey (USGS) Working Group on California Earthquake Probabilities has evaluated the probability of one or more earthquakes of Richter magnitude 6.7 or higher occurring in the San Francisco Bay Area, and concluded that there is currently a 62 percent likelihood of a magnitude 6.7 or higher earthquake occurring in the Bay Area by 2032.⁵

The San Andreas and the Hayward faults are the two faults considered to have the highest probabilities of causing a significant seismic event in the Bay Area. These two faults are classified as strike-slip-type faults⁶ and have experienced movement within the last 150 years. The San Andreas fault is a major structural feature in the region and forms a boundary between the North American and Pacific tectonic plates. Other principal faults capable of producing significant Bay Area ground shaking are listed in Table 2.7-1 and include the Calaveras fault, the Rodgers Creek fault, and the Concord–Green Valley faults, as shown on Figure 2.7-1. A major seismic event on any of these active faults could cause significant ground shaking and surface fault rupture, as was experienced during earthquakes in recent history, namely the 1868 Hayward earthquake, the

³ Division of Agricultural Science, University of California, Generalized Soil Map of California, 1951.

⁴ An active fault is defined by the State of California as a fault that has had surface displacement within Holocene time (approximately the last 10,000 years). A potentially active fault is defined as a fault that has shown evidence of surface displacement during the Quaternary (last 1.6 million years), unless direct geologic evidence demonstrates inactivity for all of the Holocene or longer. This definition does not mean that faults lacking evidence of surface displacement are necessarily inactive. “Sufficiently active” is also used to describe a fault if there is some evidence that Holocene displacement occurred on one or more of its segments or branches (Hart, E. W., Fault-Rupture Hazard Zones in California: Alquist-Priolo Special Studies Zones Act of 1972 with Index to Special Studies Zones Maps, California Geological Survey, Special Publication 42, 1990, revised 1997).

⁵ U.S. Geological Society (USGS) Working Group on California Earthquake Probabilities (WG02), Earthquake Probabilities in the San Francisco Bay Region: 2003-2032 – A Summary of Findings, Open-File Report 03-214, 2003.

⁶ “Strike-slip” faults primarily exhibit displacement in a horizontal direction, but may have a vertical component. Right-lateral strike-slip movement of the San Andreas fault, for example, means that the western portion of the fault is slowly moving north while relative motion of the eastern side is to the south.

1906 San Francisco earthquake, and the 1989 Loma Prieta earthquake. The estimated magnitudes (moment) identified in Table 2.7-1 represent *characteristic* earthquakes on particular faults.⁷

Table 2.7-1: Active¹ Faults in the Bay Area

<i>Fault</i>	<i>Recency of Movement</i>	<i>Historical Seismicity²</i>	<i>Maximum Moment Magnitude Earthquake (Mw)³</i>
Hayward	1868 Holocene	M6.8, 1868 Many <M4.5	7.1
San Andreas	1989 Holocene	M7.1, 1989 M8.25, 1906 M7.0, 1838 Many <M6	7.9
Rodgers Creek	1969 Holocene	M6.7, 1898 M5.6, 5.7, 1969	7.0
Concord–Green Valley	1955 Holocene	Historic active creep	6.9
Marsh Creek–Greenville	1980 Holocene	M5.6 1980	6.9
San Gregorio–Hosgri	Holocene; Late Quaternary	Many M3–6.4	7.3
West Napa	2000 Holocene	M5.2 2000	6.5
Maacama	Holocene	Historic active creep	7.1
Calaveras	1990 Holocene	M5.6–M6.4, 1861 M4 to M4.5 swarms 1970, 1990	6.8

¹ See text footnote #4 for definition of active faults.

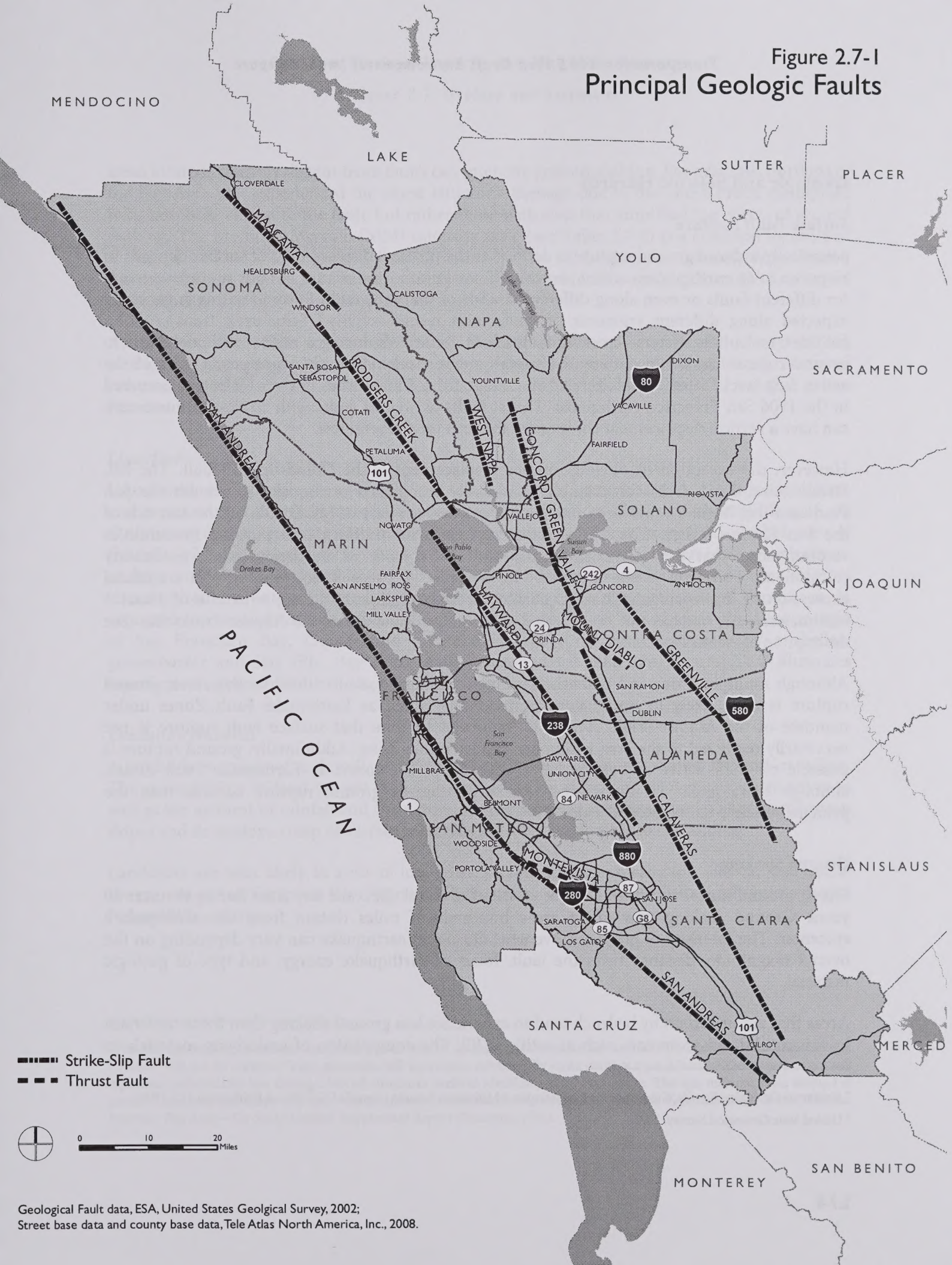
² Richter magnitude (M) and year for recent and/or large events. Richter magnitude scale reflects the maximum amplitude of a particular type of seismic wave.

³ The maximum moment magnitude earthquake (Mw), derived from the joint CGS/USGS Probabilistic Seismic Hazard Assessment for the State of California, 1996. (CGS OFR 96-08 and USGS OFR 96-706).

Sources: California Geological Survey, 1996; Hart, 1997; Jennings, 1997; Peterson, 1996; United States Geological Survey and University of California Berkeley, Northern California Earthquake Data Center, <http://quake.geo.berkeley.edu/>, accessed May 2004

⁷ Moment magnitude is related to the physical size of a fault rupture and movement across a fault, while Richter magnitude scale reflects the maximum amplitude of a particular type of seismic wave. Moment magnitude provides a physically meaningful measure of the size of a faulting event. The concept of “characteristic” earthquake means that we can anticipate, with reasonable certainty, the actual damaging earthquakes [the size of the earthquakes] that can occur on a fault.

Figure 2.7-1
Principal Geologic Faults



Geologic and Seismic Hazards

Surface Fault Rupture

Seismically induced ground rupture is defined as the physical displacement of surface deposits in response to an earthquake's seismic waves. The magnitude and nature of fault rupture can vary for different faults or even along different strands of the same fault. Future faulting is generally expected along different segments of faults with recent activity.⁸ Structures, transportation facilities, and utility systems crossing fault traces are at risk during a major earthquake due to ground rupture caused by differential lateral and vertical movement on opposite sides of the active fault trace. Lateral displacement may range from a few inches to over 20 feet, as occurred in the 1906 San Francisco earthquake. Thrust faults as well as faults with strike-slip movement can have a vertical displacement component that can total several feet.

However, the exception to obvious surface displacement is the "blind-thrust" fault. The Mt. Diablo blind-thrust fault, for example, is a newly recognized earthquake source for the San Francisco Bay Region. It has been mapped on the western base of Mt. Diablo on the east side of the San Ramon Valley. The USGS Working Group on California Earthquake Probabilities recommended that this particular thrust fault be considered in their seismic probability calculations. This fault is considered a "blind thrust" because it does not exhibit a surficial expression of displacement. The Mt. Diablo thrust fault slips at a long-term rate of about 3 millimeters/year, but has not been zoned as an active fault under the Alquist-Priolo Act (see description of Act in *Regulatory Setting*).⁹

Although multiple active and potentially active faults are located within the Bay Area, ground rupture is most likely to occur along active faults zoned as Earthquake Fault Zones under mandate of the Alquist-Priolo Act. It is important to note that surface fault rupture is not necessarily restricted to the area within an Alquist-Priolo Zone. Additionally, ground rupture is possible on both active and potentially active faults not zoned as Earthquake Fault Zones, although these faults are considered less susceptible to ground rupture hazards than the principally active faults listed in Table 2.7-1.

Ground Shaking

Strong ground movement from a major earthquake could affect the Bay Area during the next 30 years. Ground shaking may affect areas hundreds of miles distant from the earthquake's epicenter. The intensity of ground movement during an earthquake can vary depending on the overall magnitude, distance from the fault, focus of earthquake energy, and type of geologic material.

Areas that are underlain by bedrock tend to experience less ground shaking than those underlain by unconsolidated sediments such as artificial fill. The composition of underlying materials in

⁸ California Geological Survey, Guidelines for Evaluating and Mitigation Seismic Hazards, CGS Special Publication 117, 1997.

⁹ United State Geological Survey, 2003.

areas located relatively distant from faults can intensify ground shaking. For example, portions of the Bay Area that experienced the worst structural damage due to the Loma Prieta earthquake were not those closest to the fault, but rather those with soils that amplified the effects of ground shaking. The Modified Mercalli (MM) intensity scale (see Table 2.7-2) is a common measure of earthquake effects due to ground shaking intensity. The MM values for intensity range from I (earthquake not felt) to XII (damage nearly total), and intensities ranging from IV to X could cause moderate to significant structural damage.¹⁰

Areas most susceptible to intense ground shaking are those areas located closest to the earthquake-generating fault, and areas underlain by thick, loosely unconsolidated, saturated sediments, particularly soft, saturated Bay Muds and artificial fill along the tidal margins of San Francisco Bay.

Liquefaction

Liquefaction is a phenomenon whereby unconsolidated and/or near saturated soils lose cohesion and are converted to a fluid state as a result of severe vibration. The relatively rapid loss of soil shear strength during strong earthquake shaking results in the temporary fluid-like behavior of the soil. Soil liquefaction causes ground failure that can damage roads, airport runways, pipelines, underground cables, and buildings with shallow foundations. Liquefaction can occur in areas characterized by water-saturated, cohesionless, granular materials at shallow depths, or in saturated unconsolidated or artificial fill sediments located in reclaimed areas along the margin of San Francisco Bay. Liquefaction potential is highest in areas underlain by a shallow groundwater and Bay fills, Bay Mud, and unconsolidated alluvium. Figure 2.7-2 illustrates liquefaction susceptibility in the San Francisco Bay Area.

Landslide Hazards

A landslide is a mass of rock, soil, and debris displaced downslope by sliding, flowing, or falling. The susceptibility of land (slope) failure is dependent on slope and geologic characteristics, as well as the amount of rainfall and the nature of excavation or seismic activities. Areas with steep slopes and downslope creep of surface materials are most susceptible to landsliding.

Landslides are least likely in areas of low relief, such as topographically low alluvial fans and at the margin of San Francisco Bay. Figure 2.7-3 illustrates areas that have historically been affected by landslide activity.

¹⁰ The damage level represents the estimated overall level of damage that will occur for various MM intensity levels. The damage, however, will not be uniform. Some structures will experience substantially more damage than this overall level, and others will experience substantially less damage. Not all structures perform identically in an earthquake. The age, material, type, method of construction, size, and shape of a structure all affect its performance (Association of Bay Area Governments (ABAG), *The San Francisco Bay Area -- On Shaky Ground*, Supplement Report (Excerpts), 1998).

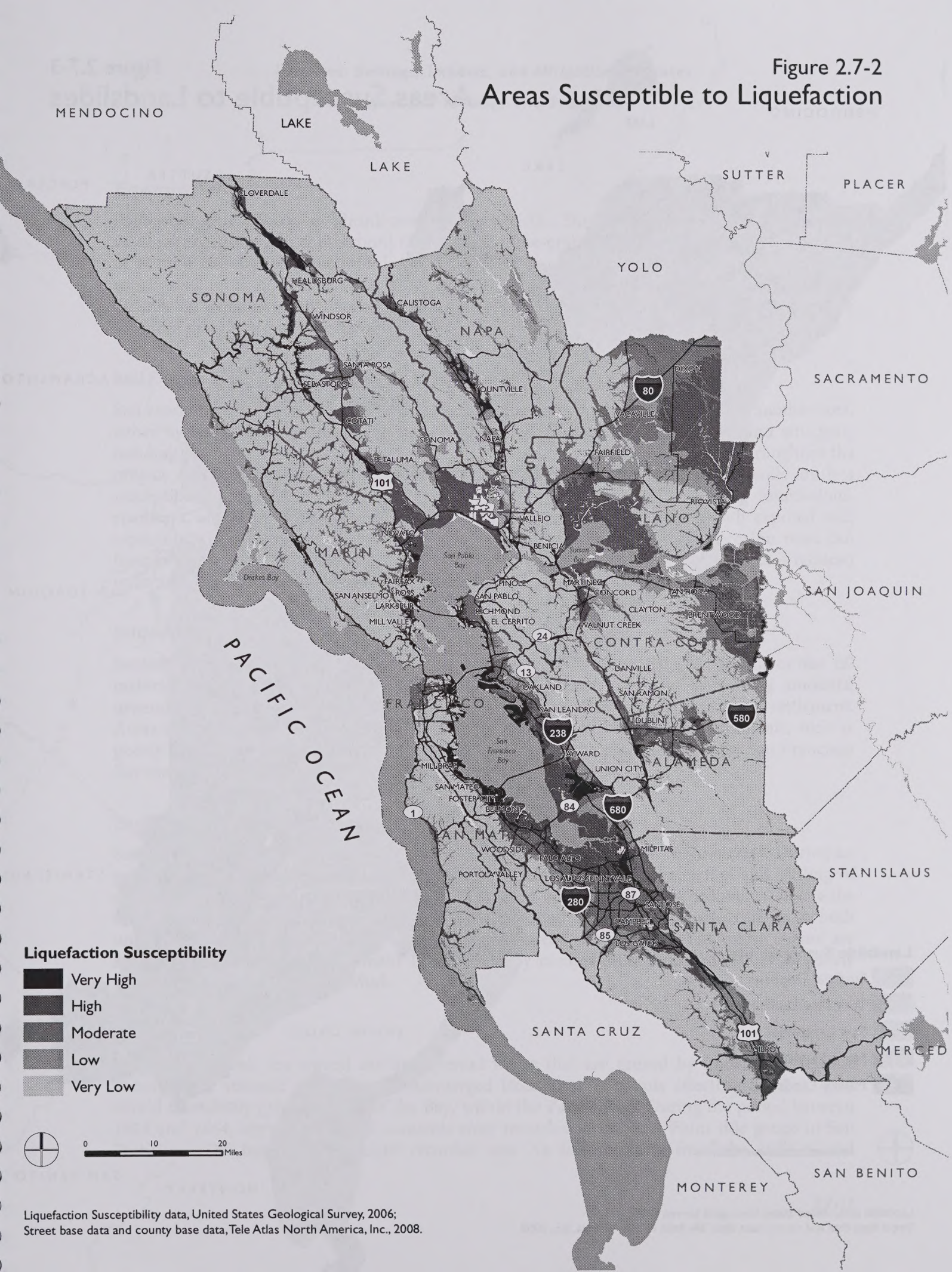
Table 2.7-2: Modified Mercalli Intensity Scale

	<i>Intensity Description</i>	<i>Average Peak Acceleration¹</i>
I	Not felt except by a very few persons under especially favorable circumstances.	<0.0017g
II	Felt only by a few persons at rest, especially on upper floors on buildings. Delicately suspended objects may swing.	<0.014g
III	Felt quite noticeably indoors, especially on upper floors of buildings, but many persons do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibration similar to a passing of a truck. Duration estimated.	<0.014g
IV	During the day felt indoors by many, outdoors by few. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.	0.014g-0.039g
V	Felt by nearly everyone, many awakened. Some dishes, windows, broken; a few instances of cracked plaster; unstable objects overturned. Disturbances of trees, poles, and other tall objects sometimes noticed. Pendulum clocks may stop.	0.039g-0.092g
VI	Felt by all, many frightened and run outdoors. Some heavy furniture moved; a few instances of fallen plaster or damaged chimneys. Damage slight.	0.092g-0.18g
VII	Everybody runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving motor cars.	0.18g-0.34g
VII	Damage slight in specially designed structures; considerable in ordinary substantial buildings, with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. Persons driving motor cars disturbed.	0.34g-0.65g
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken.	0.65g-1.24g
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from riverbanks and steep slopes.	> 1.24g
XI	Few, if any, masonry structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.	> 1.24g
XII	Practically all works of construction are damaged greatly or destroyed. Waves seen on ground surface. Lines of sight and level are distorted. Objects are thrown upward into the air.	> 1.24g

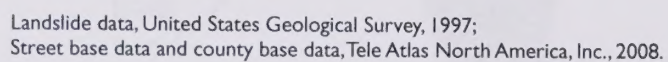
¹ g (gravity)= 980 centimeters per second squared. Acceleration of 1.0 g is equivalent to a car traveling 328 feet from rest in 4.5 seconds.

Source: Association of Bay Area Governments, 2003; California Geological Survey, 2003

Figure 2.7-2
Areas Susceptible to Liquefaction



Areas Susceptible to Landslides



Expansive Soils

Expansive soils possess a “shrink-swell” characteristic. Shrink-swell is the cyclic change in volume (expansion and contraction) that occurs in fine-grained clay sediments from the process of wetting and drying. Structural damage may occur incrementally over a long period of time, usually as a result of inadequate soil and foundation engineering or the placement of structures directly on expansive soils. Soils with high clay content, such as the Bay Mud located on the southern margin of San Francisco Bay, are highly expansive.

Soil Erosion

Soil erosion is the process whereby soil materials are worn away and transported to another area, either by wind or water. Rates of erosion can vary depending on soil material and structure, building placement, and human activity. The potential for soil erosion is variable throughout the project area. Soil with high amounts of silt can be easily eroded, while sandy soils are less susceptible to erosion. Excessive soil erosion can eventually damage building foundations, roadways, and dam embankments. Erosion is most likely on sloped areas with exposed soil, especially where unnatural slopes are created by cut-and-fill activities. Soil erosion rates can therefore be higher during the construction phase. Typically, the soil erosion potential is reduced once the soil is graded and covered with concrete, structures, or asphalt.

Settlement

Settlement is the depression of the bearing soil when a load, such as that of a building or new fill material, is placed upon it. Soils tend to settle at different rates and by varying amounts, depending on the load weight, which is a phenomenon referred to as differential settlement. Areas are susceptible to differential settlement if underlain by compressible sediments, such as poorly engineered artificial fill or the Bay Mud present in the marshland on the San Francisco Bay margin.

Earthquake-Induced Settlement

Settlement of the ground surface can be accelerated and accentuated by earthquakes. During an earthquake, settlement can occur as a result of the relatively rapid compaction and settling of subsurface materials (particularly loose, noncompacted, and variable sandy sediments) due to the rearrangement of soil particles during prolonged ground shaking. Settlement can occur both uniformly and differentially (i.e., where adjoining areas settle at different rates). Areas are susceptible to differential settlement if underlain by compressible sediments, such as poorly engineered artificial fill or Bay Mud.

Tsunamis

Tsunamis (seismic sea waves) are long period waves that are caused by underwater seismic disturbances, volcanic eruptions, or submerged landslides. Tsunamis affecting the Bay Area would most likely originate west of the Bay, within the Pacific Rim. During the period between 1854 and 1964, approximately 21 tsunamis were recorded at the Fort Point tide gauge in San Francisco. The largest wave height recorded was 7.4 feet resulting from the 1964 Alaska

earthquake. It is estimated that a tsunami with a wave height or run up to 20 feet could pass through the Golden Gate every 200 years. A ten-foot wave is estimated to occur every 90 years. A tsunami of this height would most likely produce little inundation damage except for beaches and other low-lying coastal areas.

Areas that are highly susceptible to tsunami inundation tend to be located in low-lying coastal areas such as tidal flats, marshlands, and former bay margins that have been artificially filled. Highway traffic in those low-lying areas may be disrupted due to inundation or damage caused by the tsunami.

REGULATORY SETTING

Federal Regulations

Disaster Mitigation Act of 2000

The Disaster Mitigation Act of 2000 (DMA2K) (Public Law 106-390) amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 to establish a Pre-Disaster Mitigation (PDM) program and new requirements for the federal post-disaster Hazard Mitigation Grant Program (HMGP). DMA2K encourages and rewards local and state pre-disaster planning. It promotes sustainability, and seeks to integrate State and local planning with an overall goal of strengthening statewide hazard mitigation. This enhanced planning approach enables local, tribal, and state governments to identify specific strategies for reducing probable impacts of natural hazards such as floods, fire, and earthquakes. In order to be eligible for hazard mitigation funding after November 1, 2004, local governments are required to develop a Hazard Mitigation Plan that incorporates specific program elements of the DMA2K law.

State Regulations

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act (formerly the Alquist-Priolo Special Studies Zone Act), signed into law in December 1972, requires the delineation of zones along active faults in California. The purpose of the Alquist-Priolo Act is to regulate development on or near fault traces to reduce the hazard of fault rupture and to prohibit the location of most structures for human occupancy across these traces. Cities and counties must regulate certain development projects within the zones, for example, by withholding permits until geologic investigations demonstrate that development sites are not threatened by future surface displacement.¹¹ Surface fault rupture is not necessarily restricted to the area within an Alquist-Priolo Zone.

¹¹ Hart, 1997.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act of 1990 was established to protect the public from the effects of strong ground shaking, liquefaction, landslides, or other ground failure, and from other hazards caused by earthquakes. This act requires the State Geologist to delineate various seismic hazard zones and requires cities, counties, and other local permitting agencies to regulate certain development projects within these zones. Before a development permit is granted for a site within a seismic hazard zone, a geotechnical investigation of the site must be conducted and appropriate mitigation measures incorporated into the project design. Although Seismic Hazards Maps have been released for San Francisco County and portions of the East and South Bay, the California Geological Survey has not yet completed Seismic Hazards Maps covering the entire Bay Area.

California Building Code

The California Building Code (CBC) has been codified in the California Code of Regulations (CCR) as Title 24, Part 2. Title 24 is administered by the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Under state law, all building standards must be centralized in Title 24 or they are not enforceable. The purpose of the CBC is to establish minimum standards to safeguard the public health, safety and general welfare through structural strength, means of egress facilities, and general stability by regulating and controlling the design, construction, quality of materials, use and occupancy, location, and maintenance of all building and structures within its jurisdiction. The CBC is based on the International Building Code. The 2007 CBC is based on the 2006 International Building Code (IBC) published by the International Code Conference. In addition, the CBC contains necessary California amendments which are based on the American Society of Civil Engineers (ASCE) Minimum Design Standards 7-05. ASCE 7-05 provides requirements for general structural design and includes means for determining earthquake loads as well as other loads (flood, snow, wind, etc.) for inclusion into building codes. The provisions of the CBC apply to the construction, alteration, movement, replacement, and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures throughout California.

The earthquake design requirements take into account the occupancy category of the structure, site class, soil classifications, and various seismic coefficients which are used to determine a Seismic Design Category (SDC) for a project. The SDC is a classification system that combines the occupancy categories with the level of expected ground motions at the site and ranges from SDC A (very small seismic vulnerability) to SDC E/F (very high seismic vulnerability and near a major fault). Design specifications are then determined according to the SDC.

California Department of Transportation

Jurisdiction of the California Department of Transportation (Caltrans) includes State and interstate routes within California. Any work within the right-of-way of a federal or State transportation corridor is subject to Caltrans regulations governing allowable actions and modifications to the right-of-way. Caltrans issues permits to allow encroachment on land within its jurisdiction to ensure that the encroachment is compatible with the primary uses of the State

Highway System, ensure safety, and to protect the State's investment in the highway facility. The encroachment permit requirement applies to persons, corporations, cities, counties, utilities, and other government agencies. A permit is required for specific activities, including opening or excavating a State highway for any purpose, constructing and maintaining road approaches or connections, grading within right-of-way on any State highway, or planting or tampering with vegetation growing along any state highway. The encroachment permit application requirements relating to geology, seismicity, and soils include information on road cuts, size of excavations, engineering and grading cross-sections, hydraulic calculations, and the location of mineral resources approved under the Surface Mining Area Reclamation Act.

Regional and Local Regulations

General Plans and Safety Elements

City and county governments develop, as part of a general plan, safety elements that identify goals, objectives, and implementing actions to minimize the loss of life, property damage, and disruption of goods and services from disasters, including floods, fires, nonseismic geologic hazards, and earthquakes. General plans can provide policies and establish the basis for ordinances to ensure acceptable protection of people and structures from risks associated with these hazards. Ordinances can include those addressing unreinforced masonry construction, erosion, or grading.

Hazard Mitigation Plans

In March of 2005, ABAG adopted a multi-jurisdictional Hazard Mitigation Plan for the Bay Area. Participating local county and city governments in the Bay Area prepare an Annex to this plan to explain how the plan specifically applies to that agency.

IMPACT ANALYSIS

SIGNIFICANCE CRITERIA

Implementation of the Transportation 2035 Plan would have a potentially significant adverse impact if Plan projects would:

- Criterion 1:** Increase exposure of people or structures to the risk of property loss, injury, or death involving: rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area, or based on other substantial evidence of a known fault; strong seismic ground shaking; seismic-related ground failure, including liquefaction; or landslides.
- Criterion 2:** Result in substantial soil erosion or topsoil loss.
- Criterion 3:** Locate transportation projects on: a geologic unit or soil that is unstable or that would become unstable as a result of the project; on expansive soils (high shrink-swell potential), as defined in Section 1802A.3.2 of the 2007 California Building

Code the most recent version of the California Building Code; or on weak, unconsolidated soils, creating substantial risks to life or property from on- or off-site landslide, lateral spreading, liquefaction, or collapse.

METHOD OF ANALYSIS

Impacts are determined for the proposed Transportation 2035 Plan as a whole and for specific projects involving new construction. Projects that do not include the construction of infrastructure, such as local road maintenance, wheelchair curb ramps, or traffic light coordination, would utilize existing transportation infrastructure or would result in negligible alterations to these facilities. In contrast, other projects in the Transportation 2035 Plan would include the construction or expansion of elevated interchanges, roadways, bridges, tunnels, transit buildings, and parking lots. Some of these projects, based upon generalized geology maps from United States Geological Survey and California Geological Survey, which provide broad information on the locations of active faults in the San Francisco Bay Area and areas of liquefaction or landslide potential, may be susceptible to particular seismic hazards, such as strong ground shaking due to their location near active faults. This is a program-level analysis based upon generalized potential impacts associated with seismic hazards present in the San Francisco Bay Area.

SUMMARY OF IMPACTS

The entire Bay Area is susceptible to impacts associated with seismic events on one of the many active or potentially active faults in the region. These faults could potentially generate seismic ground shaking capable of damaging existing and proposed transportation facilities. As a consequence, new transportation facilities would be exposed to both the direct and indirect effects of earthquakes as well as other existing geological hazards such as landslides and unstable soils. Potential effects from surface fault rupture and severe ground shaking could cause catastrophic damage to transportation infrastructure, particularly elevated structures. New transportation facility designs would be required by existing building codes to make use of the latest information available on seismic hazards to structures. Table 2.7-3 provides a summary of projects in the Transportation 2035 Plan that involve construction or reconstruction aspects whose footprints coincide with or partially overlap generalized geologic hazard areas for fault rupture, liquefaction and landslides.

Direct Impacts

Direct impacts associated with earthquakes include construction of new transportation facilities that would be exposed to fault rupture, ground shaking, liquefaction and potential tsunamis, and earthquake-induced landslides. Over time, settlement of unconsolidated soils also can pose problems to transportation facilities.

Short Term Impacts

Short-term impacts are those that could potentially occur during construction of transportation improvements. Soil erosion hazards could occur during preliminary stages of construction, especially during initial site grading. In addition to causing sedimentation problems in storm

drain systems, rapid water erosion could remove topsoil, cause deeply incised gullies on slopes, or undermine engineered soils beneath foundations and paved surfaces.

Long Term Impacts

Road cuts could expose soils to erosion over the life of the project, creating potential landslide and falling rock hazards. Engineered roadways can be undercut over time by uncontrolled stormwater drainage. Projects on steep grades or those requiring substantial amounts of cut and fill would pose the greatest potential for slides and erosion impacts. Engineered soils could also erode due to poor construction methods and design features or lack of maintenance. Use of appropriate construction methods, earthwork design, and road cut design could reduce this potential impact to a less-than-significant level.

Indirect / Cumulative Impacts

The projected population increase in the Bay Area will result in increased travel on all modes of transportation. This then would result in an increased risk of exposure of people and property to the potentially damaging effects of strong seismic shaking, fault rupture, seismically-induced ground failure and slope instability on both existing and proposed transportation infrastructure. The potential for structural failures, injuries and loss of life would be greatest on raised structures, on earthquake susceptible soils and within fault zones. However, proposed improvements would be constructed to current building and seismic engineering standards which are generally more conservative than have existed in the past. The cumulative impacts from the Transportation 2035 Plan are essentially the same as the direct impacts outlined above.

Other Impacts

The Transportation 2035 Plan includes improvements to roadways, interchanges, and overpasses throughout the Bay Area. All new transportation facilities, including potentially vulnerable elevated structures and bridges, will be designed to current seismic standards that were updated in the 2007 California Building Code. It is expected that as a result of these efforts, implementation of the Transportation 2035 Plan will improve the survivability of the Bay Area transportation system, reduce the risk to travelers using existing retrofitted and new transportation facilities, and reduce the overall magnitude and extent of social and economic disruption in the event of a major seismic event.

IMPACTS AND MITIGATION MEASURES

Impact

- 2.7-1 Seismic activity resulting in surface rupture, ground shaking, liquefaction, landslides or tsunamis could damage existing and proposed transportation infrastructure and pose public safety risks. (*Significant, mitigable*)**

Surface Fault Rupture. Some of the proposed transportation improvement projects could be located within Alquist-Priolo Earthquake Fault Zones and would therefore be susceptible to fault

rupture if an earthquake were to occur on the particular fault segment. The occurrence and severity of fault rupture depends on, among other factors, the location of the fault trace, magnitude of the seismic event, and underlying geology. Damage caused by surface fault rupture could include displaced pavement, rupture to underground utilities, or damage to foundations.

Table 2.7-3 provides examples of projects that are potentially susceptible to surface fault rupture hazards. Projects susceptible to severe fault rupture are generally those very close (approximately within 100 feet of a mapped active trace) to one of the 11 major active earthquake-generating faults depicted on Figure 2.7-1. Potential for structural damage injury or of life is related to the severity of the earthquake or type of construction (aerial, at-grade, tunnels, etc.). Modern engineering and design techniques focus on the preservation of life and lessening the risk of injury. These are projects with the potential to be adversely affected by lateral or vertical displacement during an earthquake of considerable magnitude.

Ground Shaking. Proposed transportation improvements susceptible to intense seismic ground shaking are also those areas in close proximity to the causative faults, and those areas underlain by thick, unconsolidated deposits, particularly soft, saturated Bay Mud and artificial fill near the shoreline of the Bay. These soft, loosely consolidated, saturated sediments have the tendency to amplify ground shaking and cause structural damage or result in collapse of older structures, especially those that have not undergone seismic retrofitting.

Liquefaction and Earthquake-Induced Landslides. The California Geological Survey, pursuant to the Seismic Hazards Act of 1990, has begun preparing seismic hazards maps of the San Francisco Bay Area. These maps identify areas highly susceptible to liquefaction or earthquake-induced landslides. At this time, only a portion of the Bay Area has been mapped though new maps continue to be added and more are planned for the future. The mapping completed to date is being used in order to assess areas prone to liquefaction or landslides for proposed transportation improvements in the Transportation 2035 Plan.

The potential for transportation projects to be significantly affected by earthquake-induced landslides is higher in hilly or mountainous areas, especially areas with historically active or inactive landslides and unstable slopes. Landslide hazards are prevalent in the Santa Cruz Mountains, the Diablo Range, and areas of Marin County. Certain geologic formations, such as loosely consolidated sedimentary deposits, are more susceptible to landslides in the event of an earthquake. Saturated slopes in close proximity to the causative fault can also increase the likelihood of landslide hazards. Landslide-prone areas are depicted in Figure 2.7-3, and projects potentially located within areas most likely to susceptible to landslides are listed in Table 2.7-3.

The potential for projects to be significantly affected by liquefaction is higher in areas underlain by shallow groundwater and unconsolidated, coarse-grained soils, such as sandy artificial fill materials or dredge spoils overlying Bay Mud. Areas historically affected by liquefaction are depicted in Figure 2.7-3, and projects potentially located in areas likely to be susceptible to very high or high levels of liquefaction are listed in Table 2.7-3.

Tsunamis. Tsunamis could occur along the Pacific Ocean shoreline and along the Bay shoreline resulting in temporarily high water levels and possible property damage, erosion, injury and loss

of life. The potential for tsunamis is highest along the Pacific Ocean shoreline because waves that reach the inner bay will have naturally attenuated once they pass through the Golden Gate.

Table 2.7-3: Projects Susceptible to Surface Fault Rupture, Landslides, or Liquefaction

Projects	Corridor	Project	Hazard		
			SFR ^a	LDS ^b	LIQ ^c
230345	Golden Gate	Rehabilitate or replace existing Healdsburg Avenue Bridge			X
22193	Golden Gate	Construct new bypass on Route 116 in Forestville			X
22438	Golden Gate	Improve Bodega Highway west of Sebastopol		X	X
94689	Golden Gate	Improve U.S. 101/Arata Lane interchange in Windsor (Phase 4)			X
230689	Golden Gate	U.S. 101 in Sonoma County from Windsor River Road to Old Redwood Highway – widen to add HOT lane and convert HOV lanes to HOT lanes			X
22191	Golden Gate	Improve U.S. North/Airport Boulevard Interchange			X
22194	Golden Gate	*Improve safety on Mark West Springs/Porter Creek Road		X	X
22204	Golden Gate	Widen Fulton Road from 2 to 4 lanes from Guerneville Road to U.S. 101 and construct Route 12/Fulton Road interchange			X
22203	Golden Gate	Improve channelization and traffic signalization on River Road from Fulton Road to the town of Guerneville			X
22207	Golden Gate	Extend Farmers Lane from Bellevue Avenue to Bennett Valley Road			X
22197	Golden Gate	Improve local circulation at various locations in Town of Penngrove			X
22195	Golden Gate	Improve U.S. 101/Old Redwood Highway interchange			X
230701	Golden Gate	Widen U.S. 101 from the Route 37 to Marin/Sonoma County line (Marin County portion) and from Marin/Sonoma County line to Old Redwood Highway in Petaluma		X	
230702	Golden Gate	U.S. 101 in Marin and Sonoma counties from Route 37 to Old Redwood Highway – convert HOV lanes to HOT lanes		X	
22437	Golden Gate	Construct auxiliary lanes at various locations along U.S. 101			X
21315	Golden Gate	Signalize ramp intersections at U.S. 101/Miller Creek Road interchange			X
230688	Golden Gate	U.S. 101 in Marin County from Corte Madera to Route 37 – convert HOV lanes to HOT lanes		X	X
21325	Golden Gate	Improve local access to U.S. 101 from Tamalpais Drive to just north of Sir Francis Drake		X	X
21030	Golden Gate	Improve U.S. 101/I-580 interchange (project approval and environmental design phases only)			X
94089	Golden Gate	*Reconstruct south access to the Golden Gate Bridge, from Doyle Drive to Broderick Street (design and construction phases)			X
98179	Golden Gate	Improve U.S. 101/Tiburon Boulevard interchange		X	X
22190	North Bay East-West	Improve channelization and traffic signalization at Route 116/Route 121 intersection		X	
230599	North Bay East-West	Implement Phase 2 improvements to Route 12 (Jamieson Canyon)			X

Table 2.7-3: Projects Susceptible to Surface Fault Rupture, Landslides, or Liquefaction

Projects	Corridor	Project	Hazard		
			SFR ^a	LDS ^b	LIQ ^c
230518	Napa Valley	*Construct a roundabout at Forest Road/Route 128			X
230519	Napa Valley	Improve the safety of the Route 29/Route 128 (Rutherford Crossroad) intersection			X
230387	Napa Valley	*Improve safety at the Deer Park/Silverado Trail intersection			X
230376	Napa Valley	Construct pedestrian and bicycle crossing at Tunnel of Elms in St. Helena			X
230377	Napa Valley	Construct pedestrian and bicycle crossing over Sulphur Creek at Oak Avenue in St. Helena			X
230374	Napa Valley	Construct pedestrian crosswalk at Charter Oak and Main Streets in St. Helena			X
230379	Napa Valley	Improve the truck route between Adams and Main Street			X
230381	Napa Valley	Improve signalization along Main Street in St. Helena			X
230390	Napa Valley	*Improve the safety of the Oakville Crossroad/Route 29 intersection			X
230498	Napa Valley	Construct Class I bicycle trail from Route 29 to Silverado Trail			X
230371	Napa Valley	Construct ADA-compliant pedestrian and bicycle path from Presidents Circle to railroad track in Yountville			X
230373	Napa Valley	Construct pedestrian and bicycle pathway from Madison Street to Solano Avenue			X
230508	Napa Valley	Elevate Solano Avenue from Yountville to Dry Creek Road			X
230499	Napa Valley	Construct bicycle/pedestrian path from Oak Circle to south Yountville town limit			X
22746	Napa Valley	Widen Route 29/First Street overcrossing to 4 lanes			X
230486	Napa Valley	Extend Devlin Road from Tower Road to Airpark Road in American Canyon			X
230392	Napa Valley	Extend Devlin Road from Fagan Creek to Green Island Road			X
230622	Napa Valley	Construct new bicycle/pedestrian trail through American Canyon			X
230659	Eastshore North	I-80 in Solano County from Yolo County line to Route 37 – widen to add HOT lane from Yolo County line to Air Base Parkway and from Red Top Road to Route 37	X	X	X
94151	Eastshore North	Construct 4-lane Jepson Parkway from Route 12 to Leisure Town Road			X
22700	Eastshore North	Construct parallel corridor north of I-80 from Red Top Road to Abernathy Road			X
230468	Eastshore North	Provide auxiliary lanes on I-80 in eastbound and westbound directions from I-680 to Air Base Parkway			X
230660	Eastshore North	I-80 in Solano County from Red Top Road to Air Base Parkway – convert existing HOV lane to HOT lane		X	X
22629	Eastshore North	Construct new Vallejo Baylink Ferry Terminal			X

Table 2.7-3: Projects Susceptible to Surface Fault Rupture, Landslides, or Liquefaction

Projects	Corridor	Project	Hazard		
			SFR ^a	LDS ^b	LIQ ^c
230658	Eastshore North	I-80 in Solano County from Route 37 to Carquinez Bridge – widen to add HOT lane			X
230657	Eastshore North	I-80 in Contra Costa County from Carquinez Bridge to Alameda-Contra Costa County line – convert existing HOV lanes to HOT lanes	X	X	X
230321	Eastshore North	Construct Phase 2 of Hercules Intermodal Station			X
230279	Eastshore North	Extend John Muir Parkway in Hercules			X
230318	Eastshore North	Extend North Richmond truck route along Soto Street from Market Avenue to Parr Boulevard			X
230084	Eastshore North	Construct a railroad grade separation at the Richmond Waterfront on the Marina Bay Parkway			X
22355	Eastshore North	Modify I-80/Central Avenue interchange			X
22360	Eastshore North	Reconstruct I-80/San Pablo Dam Road interchange and modify adjacent interchanges	X		X
21144	Eastshore North	Reconstruct I-80/Gilman Avenue interchange			X
230656	Eastshore North	I-80 in Alameda County from Alameda-Contra Costa County line to Bay Bridge – convert existing HOV lanes to HOT lanes			X
22089	Eastshore North	Improve Martinez Subdivision to include two additional mainline tracks			X
230108	Eastshore North	Widen I-80 Eastbound Powell Street off-ramp in Emeryville			X
230306	Delta	Add a second southbound lane on Alhambra Avenue from Walnut Avenue to the south side of Highway 4			X
230690	Delta	I-680/Route 4 direct HOT connector in Contra Costa County – widen to add HOT lane			X
230654	Delta	Route 4 in Contra Costa County from Route 160 to Port Chicago Highway – convert existing HOV lanes to HOT lanes			X
230291	Delta	Add northbound truck climbing lane and a bicycle lane on Kirker Pass Road from Clearbrook Drive in Concord to just beyond the crest of Kirker Pass		X	X
98222	Delta	Construct freeway-to-freeway direct connectors between Route 4 Bypass and Route 160			X
230232	Delta	Construct new interchange at Route 4/Phillips Lane			X
230289	Delta	Construct Main Street Downtown Bypass road between Vintage Parkway and 2nd Street			X
230247	Delta	Widen Lone Tree Way to 6 lanes from O'Hara Avenue to Brentwood Boulevard			X
230687	Diablo	I-680/I-80 direct HOT connector in Solano County – widen to add HOT lane			X

Table 2.7-3: Projects Susceptible to Surface Fault Rupture, Landslides, or Liquefaction

Projects	Corridor	Project	Hazard		
			SFR ^a	LDS ^b	LIQ ^c
230686	Diablo	I-680 in Solano County from Benicia-Martinez Bridge to I-80 – widen to add HOT lane		X	X
22354	Diablo	Relocate the western half of the Marina Vista interchange off southbound I-680			X
22614	Diablo	Construct Martinez Intermodal Station (Phase 3)			X
230685	Diablo	I-680 in Contra Costa County from Alcosta Road to Benicia-Martinez Bridge – widen to add HOT lane and convert existing HOV lanes to HOT lanes	X		X
98133	Diablo	Widen Pacheco Boulevard to 4 lanes from Blum Road to Arthur Road		X	X
230240	Diablo	Add additional left- or right-turn lanes at various intersections along Contra Costa Boulevard (between Monument Boulevard and 2nd Avenue)			X
22388	Diablo	Construct Route 242 on-ramp and off-ramp at Clayton Road			X
230216	Diablo	Construct two-lane bridge connecting Waterworld Parkway with Meridan Park Boulevard			X
230308	Diablo	*Straighten curves to improve safety and operation of Alhambra Valley Road		X	X
22602	Diablo	Construct I-680 auxiliary lanes in both directions from Sycamore Valley Road to Crow Canyon Road			X
22352	Diablo	Improve I-680/Norris Canyon Road			X
230307	Diablo	Widen Camino Tassajara Road from 2 lanes to 4 lanes from Windemere Parkway to the Alameda/Contra Costa County line			X
21139	Tri-Valley	*Improve Vasco Road with safety features	X		
98198	Tri-Valley	*Improve safety and operations on Vasco Road in Contra Costa and Alameda counties	X	X	X
230665	Tri-Valley	I-580 westbound in Alameda County from San Joaquin County line to I-680 – widen to add HOT lane and convert existing HOV lane to HOT lane	X	X	X
22765	Tri-Valley	Improve the connection between I-580 and I-680 via HOV direct connectors			X
230684	Tri-Valley	I-680/I-580 direct HOT connector in Alameda County – widen to add HOT lane at connector and eastbound to Tassajara Road			X
230086	Tri-Valley	Reconstruct I-580/Fallon Road interchange and I-580/Hacienda Drive interchange in Dublin			X
230667	Tri-Valley	I-580 eastbound in Alameda County from Greenville Road to Tassajara Road – convert HOV lane to HOT lane		X	X
230132	Tri-Valley	Improve I-580/Isabel Avenue interchange			X
230608	Tri-Valley	Construct a westbound auxiliary lane on I-580 between First Avenue and Isabel Avenue in the Tri-Valley area		X	X
21100	Tri-Valley	Construct auxiliary lanes on I-580 between Vasco Road and First Street and modify I-580/Vasco Road interchange			X

Table 2.7-3: Projects Susceptible to Surface Fault Rupture, Landslides, or Liquefaction

Projects	Corridor	Project	Hazard		
			SFR ^a	LDS ^b	LIQ ^c
230666	Tri-Valley	I-580 eastbound in Alameda County from San Joaquin County line to Greenville Road – widen to add HOT lane	X	X	X
22776	Tri-Valley	Widen Route 84 near Stanley Boulevard		X	X
21112	Sunol Gateway	*Improve Crow Canyon Road by widening shoulders, realigning curves and constructing retaining walls	X	X	X
230683	Sunol Gateway	Regional HOT Network: I-680 from State Route 84 to Alcosta - Widen to add HOV/HOT lane		X	X
230682	Sunol Gateway	Regional HOT Network: I-680 northbound from Santa Clara County line to State Route 84 - Widen to add HOV/HOT lane	X		X
230681	Sunol Gateway	Regional HOT Network: I-680 northbound from Alameda County line to Calaveras - Widen to add HOV/HOT lane			X
230171	Eastshore South	Improve Route 24/Caldecott Tunnel, including bicycle and transit access and sound wall improvements	X	X	X
230671	Eastshore South	Regional HOT Network: I-880 16th Street to Bay Bridge Toll Plaza - Convert HOV to HOT			X
98207	Eastshore South	Improve I-880/Broadway-Jackson interchange in Oakland			X
22768	Eastshore South	*Retrofit and repair three Oakland-Alameda estuary bridges for seismic safety			X
22766	Eastshore South	Assess Fruitvale Avenue rail bridge for seismic retrofit			X
22783	Eastshore South	*Assess Fruitvale Avenue bridge for seismic retrofit			X
22084	Eastshore South	Improve access to Oakland International Airport's North Field			X
230670	Eastshore South	I-880 in Alameda County from Marina Boulevard/Lewelling Boulevard to Hegenberger Road – convert HOV lanes to HOT lanes			X
21451	Eastshore South	Construct additional turn- and bus-loading lanes on Hesperian Boulevard and East 14th Street			X
230669	Eastshore South	I-880 in Alameda County from Alameda-Santa Clara County line to Marina Boulevard/Lewelling Boulevard – convert HOV lanes to HOT lanes			X
230047	Eastshore South	Reconstruct I-880 West A Street interchange in Hayward			X
230053	Eastshore South	Reconstruct I-880 Industrial Parkway interchange (Phase I)			X
94506	Fremont South Bay	Construct an improved east-west connection between I-880 and Route 238 (Mission Boulevard) from North Fremont to Union City			X
230114	Fremont South Bay	Widen Auto Mall Parkway from 4 to 6 lanes between I-680 and I-880			X
22145	Silicon Valley	Widen westbound Route 237 on-ramp from Route 237 to northbound U.S. 101 to 2 lanes			X

Part Two: Settings, Impacts, and Mitigation Measures

Chapter 2.7: Geology and Seismicity

Table 2.7-3: Projects Susceptible to Surface Fault Rupture, Landslides, or Liquefaction

Projects	Corridor	Project	Hazard		
			SFR ^a	LDS ^b	LIQ ^c
230257	Silicon Valley	Convert HOV direct freeway connectors between I-880 and Route 237 to HOT direct freeway connectors			X
230298	Silicon Valley	Replace Calaveras Boulevard 4-lane bridge over the Union Pacific railroad tracks			X
230273	Silicon Valley	Widen Montague Expressway to 8 lanes between Trade Zone Boulevard and I-680 and to 6 lanes between I-680 and Park Victoria Drive for HOV lanes			X
22965	Silicon Valley	Construct U.S. 101/Mabury Road/Taylor Street interchange			X
21722	Silicon Valley	Improve US 101 southbound Trimble Road/De La Cruz Boulevard/Central Expressway interchange			X
230262	Silicon Valley	Construct a new interchange at U.S. 101 and Montague Expressway			X
230265	Silicon Valley	Improve the operations of the intersection of Montague Expressway and Mission College Boulevard			X
22878	Silicon Valley	Realign Wildwood Avenue to connect with Lawrence Expressway			X
22153	Silicon Valley	Extend Mary Avenue north across Route 237			X
22156	Silicon Valley	Improve Route 85 northbound to Route 237 eastbound connector ramp			X
22162	Silicon Valley	Improve Route 237 westbound to Route 85 southbound connector ramp			X
22873	Silicon Valley	Widen Loyola Bridge over Foothill Expressway			X
22815	Silicon Valley	Upgrade Miramonte Avenue bikeway to Class II between Mountain View and Foothill Expressway			X
22179	Silicon Valley	Widen Central Expressway from 4 to 6 lanes between Lawrence Expressway and San Tomas Expressway			X
22180	Silicon Valley	Widen Central Expressway between Lawrence Expressway and Mary Avenue to provide auxiliary lanes			X
22883	Silicon Valley	Modify medians on Lawrence Expressway for limited access	X		X
22843	Silicon Valley	Widen Lawrence Expressway from 6 to 8 lanes between Moorpark Avenue/Bollinger Road and south of Calvert Court			X
22186	Silicon Valley	Widen San Tomas Expressway to 8 lanes between El Camino Real (Route 82) and Williams Road			X
230210	Silicon Valley	*Rebuild box culvert under San Tomas Expressway			X
22895	Silicon Valley	Improve the operations of San Tomas Expressway/Route 17 interchange			X
230242	Silicon Valley	Add Capitol Expressway Traffic Operations System between U.S. 101 and Almaden Expressway			X
22142	Silicon Valley	Improve U.S. 101/Capitol Expressway interchange			X
21785	Silicon Valley	Reconfigure local roadway and interchange at U.S. 101/Blossom Hill Road in San Jose			X
22809	Silicon Valley	Realign DeWitt Avenue/Sunnyside Avenue intersection			X

Table 2.7-3: Projects Susceptible to Surface Fault Rupture, Landslides, or Liquefaction

Projects	Corridor	Project	Hazard		
			SFR ^a	LDS ^b	LIQ ^c
22910	Silicon Valley	Add Traffic Operations System (TOS) infrastructure on Santa Teresa Boulevard between Day Road and Mesa Road	X		X
22842	Silicon Valley	Improve Route 152/Ferguson Road intersection			X
21714	Silicon Valley	Widen U.S. 101 between Monterey Highway and Route 25 and construct a full interchange at U.S. 101/Route 25/Santa Teresa Boulevard			X
21549	Peninsula	Implement direct access route from Hunters Point Shipyard to U.S. 101			X
22227	Peninsula	Extend Geneva Avenue to the U.S. 101/Candlestick Point interchange			X
21604	Peninsula	Construct auxiliary lanes (one in each direction) on U.S. 101 from Sierra Point to San Francisco County line		X	X
22229	Peninsula	Reconstruct U.S. 101/Sierra Point Parkway interchange		X	X
21623	Peninsula	Improve Caltrain stations			X
22279	Peninsula	Construct new U.S. 101/Produce Avenue interchange			X
21610	Peninsula	Construct auxiliary lanes (one in each direction) on U.S. 101 from San Bruno Avenue to Grand Avenue			X
22239	Peninsula	Widen Manor Drive overcrossing at Route 1			X
98204	Peninsula	Add travel lane (one in each direction) on Route 1 (Calera Parkway) between Fassler Avenue and Westport Drive in Pacifica		X	X
21613	Peninsula	Improve Route 92 from San Mateo Bridge to I-280	X		
21893	Peninsula	Widen Route 92 from Half Moon Bay city limits and Pilarcitos Creek		X	
22751	Peninsula	Improve operations and safety of Route 1 in Half Moon Bay			X
230663	Peninsula	U.S. 101 in San Mateo County from San Mateo/Santa Clara County line to Whipple Avenue – convert existing HOV lanes to HOT lanes			X
21892	Peninsula	Widen Woodside Road from 4 to 6 lanes from El Camino Real to Broadway			X
21603	Peninsula	Modify U.S. 101/Woodside Road interchange			X
21612	Peninsula	Improve access to/from west side of Dumbarton Bridge on Route 84 connecting to U.S. 101			X
21607	Peninsula	Modify University Avenue overcrossing of U.S. 101 to improve operational efficiency and safety			X
230211	San Francisco	Extend trolley coach infrastructure into Mission Bay along 16th Street and Third Street, and implement transit signal priority along 16th Street and Fillmore Street			X
22462	San Francisco	Implement bicycling programs, including construction and rehabilitation of bicycle lanes and paths; improve signage and crossings; and implement a public awareness campaign			X
230164	San Francisco	Implement a Bus Rapid Transit (BRT) project on Geary Boulevard			X

Table 2.7-3: Projects Susceptible to Surface Fault Rupture, Landslides, or Liquefaction

Projects	Corridor	Project	Hazard		
			SFR ^a	LDS ^b	LIQ ^c
230168	San Francisco	Improve the Great Highway between Lincoln Way and 48th Avenue			X
230594	San Francisco	Improve San Francisco BART stations to enhance passenger safety, accessibility and capacity, improve signage and provide real time transit information			X
230207	San Francisco	Implement a Bus Rapid Transit (BRT) project on the Geneva Avenue/Harney Way corridor		X	
230490	San Francisco	Reconstruct and widen Harney Way to 8 lanes			X
230672	Transbay	Route 92 in Alameda County from Clawiter Road through San Mateo-Hayward Bridge toll plaza – convert HOV lanes to HOT lanes			X
230673	Transbay	Route 84 in Alameda County from I-880 through Dumbarton Bridge toll plaza – convert HOV lanes to HOT lanes			X
22676	Region Wide Projects	Improve passenger capacity at 43 BART stations			X

Notes:

^a A surface fault rupture hazard was marked for any project that was mapped in the GIS database within 100 feet of an active fault.

^b A landslide hazard was marked for any project located within a “many” or “mostly” landslide area as mapped by the USGS as shown in Figure 2.7-3.

^c A liquefaction hazard was marked for any project located within a moderate or higher as shown in Figure 2.7-2.

* Projects that are part of the Heavy Maintenance/Climate Protection Emphasis Alternatives

Source: Environmental Science Associates, 2008

Mitigation Measure

2.7(a) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce significant seismic impacts, as determined by a State licensed geotechnical professional, that shall be considered by project sponsors and decision-makers may include, but are not limited to, those described below.

- Consider seismicity of the site, soil response at the site, and dynamic characteristics of the structure in the seismic design of the project, in compliance with the California Building Code and Caltrans’ standards for construction, or other more stringent standards, as applicable.
- Facilitate geotechnical analyses as necessary within construction areas to ascertain soil types and local faulting prior to preparation of project designs.

- For projects located within Alquist-Priolo Earthquake Fault Zones, prepare recommendations for the mitigation and reduction of hazards in accordance with California Geological Survey Guidelines for Evaluation the Hazard of Earthquake Fault Rupture.¹²
- Avoid or stabilize landslide areas and potentially unstable slopes wherever feasible.
- For projects located within liquefaction or earthquake-induced landslide Seismic Hazard Zones, prepare recommendations for the mitigation and reduction of hazards in accordance with California Geological Survey Guidelines for Evaluating and Mitigating Seismic Hazards Special Publication 117.¹³
- For projects adjacent to the Bay and/or Pacific Ocean, evaluate tsunami inundation risks and implement, where necessary and feasible, precautionary measures, such as specifying final roadbed elevations greater than the expected height of a tsunami with a given return frequency.

Implementation of this mitigation measure, and the design and construction of improvements according to the latest California Building Code and local code requirements, is expected to reduce potentially significant seismic hazards to a level that is less than significant.

Impact

2.7-2 Highway and rail construction could require significant earthwork and road cuts, which could increase short-term and long-term soil erosion potential. (*Significant, mitigable*)

Construction activities, such as backfilling, grading and compaction can expose areas of loose soil that, if not properly stabilized, could be subjected to soil loss and erosion by wind and stormwater runoff. Concentrated storm water runoff, if not managed or controlled, can eventually result in significant soil loss that can threaten foundations and undermine sidewalks and roadways. Development and redevelopment projects that disturb areas that are greater than one acre are required to obtain a National Pollution Discharge Elimination System (NPDES) General Construction Permit which must include a Storm Water Pollution Prevention Plan (SWPPP). These SWPPPs typically contain numerous erosion control measures that effectively reduce the potential for erosion and loss of topsoil. Projects that are less than one acre, with implementation of the mitigation measure below would reduce the potential impact from erosion and loss of topsoil to less than significant levels.

All construction activities and design criteria are required to comply with applicable codes and requirements of the most current version of the California Building Code (Title 22), and applicable Caltrans construction and grading ordinances. In addition to existing regulations, the following measure shall apply.

¹² California Geological Survey, 2002.

¹³ California Geological Survey, 1997.

Mitigation Measure

2.7(b) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures that shall be considered by project sponsors and decision-makers may include, but are not limited to, Best Management Practices to reduce soil erosion by water and wind. These could include temporary cover of exposed, engineered slopes, or silt fencing. Where required, based on affected area (greater than one acre), agencies shall adhere to the requirements of the NPDES General Construction Permit and associated SWPPP.

Implementation of this mitigation measure, and the design and construction of improvements according to the latest California Building Code and local code requirements, is expected to reduce potentially significant erosion impacts to a level that is less than significant.

Impact

2.7-3 Highway and rail construction could require significant earthwork and road cuts, which could destabilize existing slopes causing landslides or slope failure. (*Significant, mitigable*)

Slope failures and landslides could occur over time as a result of rainfall, seismic activity, or human activity such as earthwork and grading. Although, most of the proposed projects would likely occur within previously graded or developed areas, some projects could affect local slopes such as road cuts. The creation of new loads such as fills or other improvements as well as the excavation of the toe of slopes can cause existing stable slopes to become unstable. However, by implementing appropriate slope conditioning measures such as compaction standards, slope terracing, drainage control, and other slope stability measures, any existing potential slope stability hazards can be reduced to less than significant levels through current geotechnical industry standards, local grading ordinances, and the California Building Code.

Mitigation Measure

2.7(c) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures that shall be considered by project sponsors and decision-makers may include, but are not limited to, ensuring that project designs provide adequate slope drainage and appropriate landscaping to minimize the occurrence of slope instability and erosion. Road cuts shall be designed to maximize the potential for revegetation. Project sponsors shall ensure that local grading ordinances and building code requirements are strictly adhered to where appropriate.

Implementation of this mitigation measure, and the design and construction of improvements according to the latest California Building Code and local code requirements, is expected to reduce potentially significant erosion impacts to a level that is less than significant.

Impact

2.7-4 Projects built on highly compressible or expansive soils could become damaged and weakened over time. (*Significant, mitigable*)

Inadequate soil and foundation engineering on weak or unconsolidated soils (such as poorly engineered artificial fill) could cause soils and overlying structures to settle unevenly, thereby weakening structural facilities. Low-strength soils subjected to settlement could, over time, cause damage to underground utilities such as pipelines and tunnels. Structures placed directly on expansive soils could be subject to seasonal shrink-swell effects, causing structural damage and possibly damage to underground utilities.

Mitigation Measure

2.7(d) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures that shall be considered by project sponsors and decision-makers may include, but are not limited to, ensuring that geotechnical investigations be conducted by qualified professionals (registered civil and geotechnical engineers, registered engineering geologists) to identify the potential for differential settlement and expansive soils and to recommend corrective measures, such as structural reinforcement and replacing soil with engineered fill. Recommended measures shall be incorporated into project designs.

Implementation of this mitigation measure, and the design and construction of improvements according to the latest California Building Code and local code requirements, is expected to reduce potentially significant impacts related to compressible or expansive soils to a level that is less than significant.

Cumulative Impact

2.7-5 The proposed Transportation 2035 Plan, combined with regional population growth, would result in an increased risk of exposure of people and property to geologic hazards. (*Significant Cumulative Impact, Contribution Considerable, Mitigable*)

Population growth and development of all types in the Bay Area, including transportation infrastructure, will contribute to an overall cumulative increase in risk related to strong seismic shaking, fault rupture, seismically-induced ground failure and slope instability. However, in terms of the transportation system, this increase in risk is partially offset by safety and operational improvements and other transportation infrastructure improvements included in the

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2.8 Water Resources

This chapter provides a programmatic analysis of the impacts of the Transportation 2035 Plan on surface and ground water resources in the Bay Area, as well as the potential for Plan projects to increase regional vulnerability to flooding. For a discussion of sea (and bay) level rise impacts on the transportation system, see *Chapter 2.5: Greenhouse Gases and Climate Change*.

ENVIRONMENTAL SETTING

PHYSICAL SETTING

Regional Physiography

The San Francisco Bay Delta system is generally regarded as the most important water system in California. The Delta is comprised of the convergence of the Sacramento and San Joaquin Rivers which receive runoff from about 40 percent of the land in California (60,000 square miles) and 47 percent of the State's total stream flow through the Carquinez Strait and San Pablo Bay. More than 90 percent of runoff occurs during the winter and spring months from rainstorms and snow melt. San Francisco Bay encompasses approximately 1,600 square miles and is surrounded by the nine Bay Area counties. The drainage basin that contributes surface water flows directly to the Bay covers a total area of 3,464 square miles. The largest subbasins include Alameda Creek (695 square miles), the Napa River (417 square miles), and Coyote Creek (353 square miles). The San Francisco Bay estuary includes deep-water channels, tidelands, and marshlands that provide a variety of habitats for plants and animals. The salinity of the water varies widely as the landward flows of saline water and the seaward flows of fresh water converge near the Benicia Bridge. The salinity levels in the Central Bay can vary from near oceanic levels to one-quarter as much, depending on the volume of freshwater runoff.

Surface Waters

Surface waters in the Bay Area include freshwater rivers and streams, coastal waters, and estuarine waters. Many of the original drainages toward the San Francisco Bay have been channelized and put underground due to urbanization, though a few remain. Estuarine waters include the San Francisco Bay Delta from the Golden Gate to the Sacramento and San Joaquin Rivers, and the lower reaches of various streams that flow directly into the Bay, such as the Napa and Petaluma Rivers in the North Bay and the Coyote and San Francisquito Creeks in the South Bay. The major water bodies in the Bay Area, including creeks and rivers, are presented in Figure 2.8-1.

Groundwater

A groundwater basin is an area underlain by permeable materials capable of storing a significant amount of water. Groundwater basins are considered three-dimensional units defined by physical barriers that contain flow. Groundwater basins are closely linked to local surface waters. As water flows from the hills toward the Bay, it percolates through permeable soils into the groundwater basins. The nine-county Bay Area contains a total of 28 groundwater basins. The ten primary groundwater basins are the Petaluma Valley, Sonoma Valley, Suisun-Fairfield Valley, San Joaquin Valley, Clayton Valley, Diablo Valley, San Ramon Valley, Livermore Valley, and Santa Clara Valley basins. Groundwater in the Bay Area is used for numerous purposes, including municipal and industrial water supply; however, groundwater use accounts for only about 5 percent of the total water usage.

Water Quality

The quality of regional surface water and groundwater resources is affected by point-source and nonpoint-source discharges throughout individual watersheds. Regulated point sources such as wastewater treatment effluent discharges usually involve a single discharge into receiving waters. Nonpoint sources involve diffuse and nonspecific runoff that enters receiving waters through storm drains or from unimproved natural landscaping. Common nonpoint sources include urban runoff, agricultural runoff, resource extraction (ongoing and historical), and natural drainage. Pollutants that enter water bodies in urban runoff include oil and gasoline by-products from parking lots, streets, and freeways. Copper from brake linings and lead from counterweights contribute heavy metals to local waters. In addition, impervious surfaces increase runoff quantities, taxing flow capacities of local flood control systems and deteriorating natural habitats.

Regionally, stormwater runoff is estimated to contribute more heavy metals to the San Francisco Bay than direct municipal and industrial dischargers, as well as significant amounts of motor oil, paints, chemicals, debris, grease, and detergents. Runoff in storm drains may also include pesticides and herbicides from lawn care products and bacteria from animal waste. Most runoff flows untreated into creeks, lakes, and the Bay. As point sources of pollution have been brought under control, the regulatory focus has shifted to nonpoint sources, particularly urban runoff. Additional information regarding water quality in the Bay Area is provided in the regulatory setting, below.

Flood Hazards

Annual rainfall in the Bay Area can range from 8 to 9 inches per year in the inland valleys to as much as 24 inches in the coastal hills and northern reaches of the region. Approximately 95 percent of annual precipitation in the Bay Area occurs between October and April, and flooding can occur in urban creeks and streams during more intense rainstorms. The U.S. Congress passed the National Flood Insurance Act in 1968 and the Flood Disaster Protection Act in 1973 to restrict certain types of development on floodplains and to provide for a national flood insurance program. The purpose of these acts is to reduce the need for large, publicly funded flood control structures and disaster relief.

The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program. The program provides subsidized flood insurance to communities that comply with FEMA regulations to limit development in floodplains. FEMA issues Flood Insurance Rate Maps

for communities participating in the National Flood Insurance Program. Figure 2.8-2 identifies federally designated flood hazard zones in the Bay Area.

FEMA classifies flood hazard zones as follows:

- *Zone A.* Flood insurance rate zone that corresponds to the 100-year floodplain, determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone. Mandatory flood insurance purchase requirements apply.
- *Zone B, C, and X.* Flood insurance rate zones that correspond to areas outside the limits of the 100-year floodplains; areas subject to 100-year sheet-flow flooding with average depth of less than 1 foot; areas of 100-year stream flooding where the contributing drainage area is less than one square mile; or areas protected from the 100-year flood by levees from the base flood. No base flood elevations or depths are shown within this zone.
- *Zone D.* Flood insurance rate zones that correspond to areas where there are possible but undetermined flood hazards. No analysis of flood hazards has been conducted. Mandatory flood insurance purchase requirements do not apply, but coverage is available. Flood insurance rates within Zone D are commensurate with the uncertainty of the flood hazard.

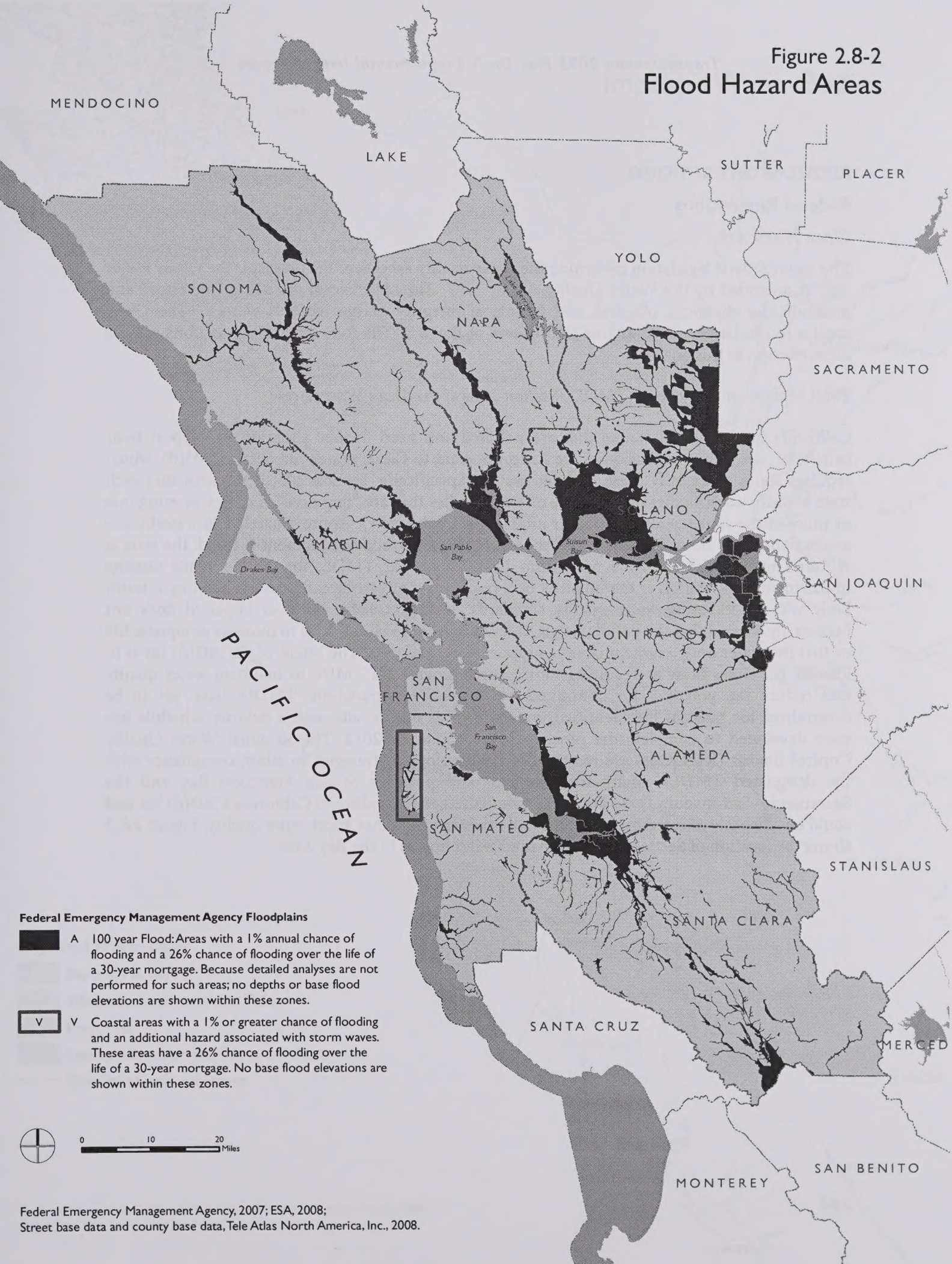
Many local jurisdictions regulate development within floodplains. Construction standards are established within local ordinances and planning elements to reduce flood impedance, safety risks, and property damage. Historic floods in the Bay Area have been devastating. In response, local flood control agencies and the U.S. Army Corps of Engineers have established extensive flood control projects, including dams and improved channels. Concrete and riprap levees and river bottoms have significantly reduced riparian habitats throughout the region.

Figure 2.8-1



Major Water data, TeleAtlas North America, 2007;
Street base data and county base data, Tele Atlas North America, Inc., 2008.

Figure 2.8-2
Flood Hazard Areas



REGULATORY SETTING

Federal Regulations

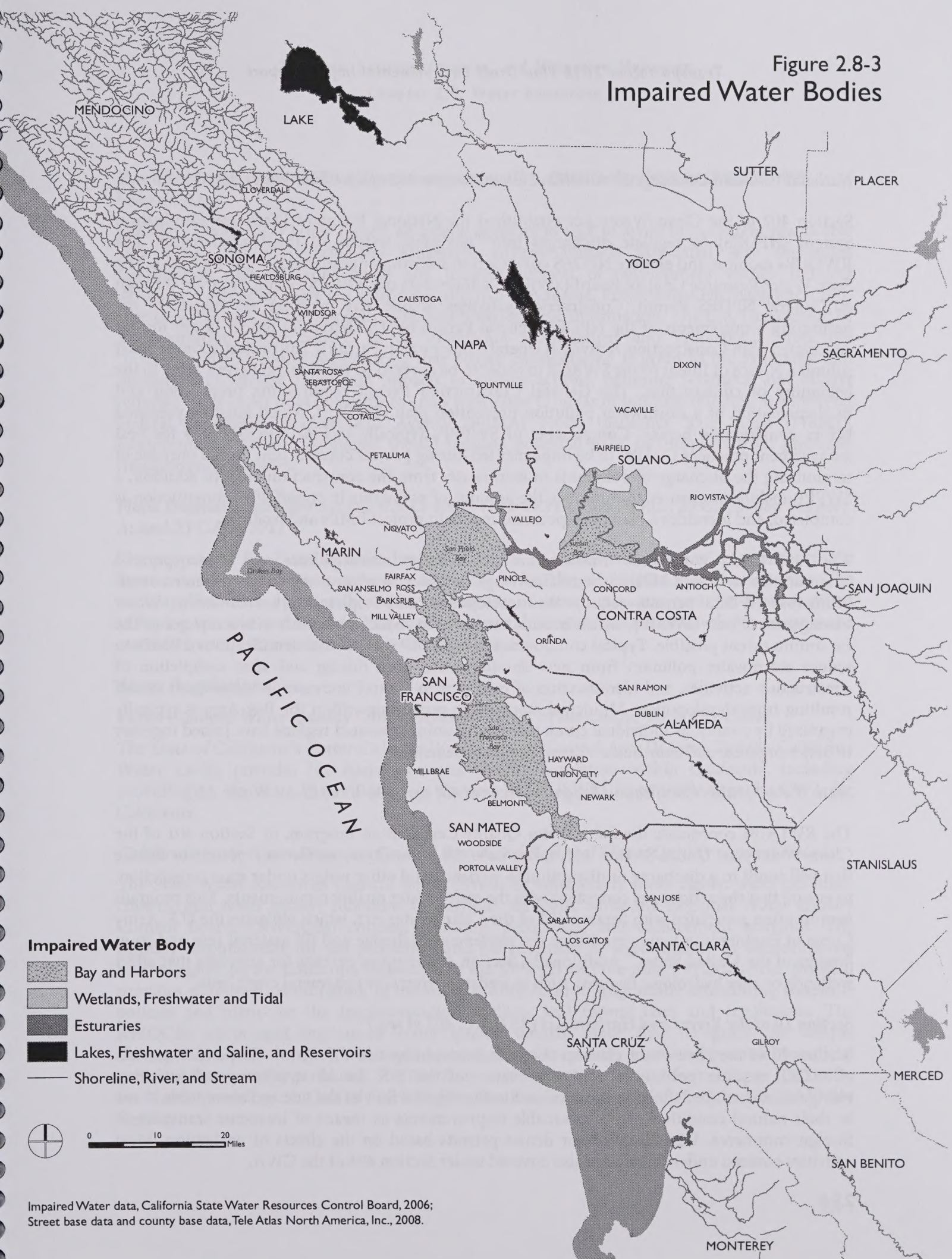
Clean Water Act

The major federal legislation governing the water quality aspects of the project is the Clean Water Act, as amended by the Water Quality Act of 1987. The objective of the act is “to restore and maintain the chemical, physical, and biological integrity of the nation’s waters.” The CWA applies to discharges of pollutants into waters of the U.S. The following CWA sections are the most relevant to this analysis.

Total Maximum Daily Load (TMDL) (Section 303d of the Clean Water Act)

California has identified waters that are polluted and need further attention to support their beneficial uses. These water bodies are listed pursuant to Clean Water Act Section 303(d), which requires states to identify these polluted waters. Specifically, Section 303(d) requires that each state identify water bodies or segments of water bodies that are “impaired” (i.e., not meeting one or more of the water quality standards established by the state). Approximately 500 waterbodies or segments have been listed in California. Once the water body or segment is listed, the state is required to establish a “Total Maximum Daily Load,” or TMDL, for the pollutant causing impairment. The TMDL is the quantity of a pollutant that can be safely assimilated by a water body without violating water quality standards. Listing a water body as impaired does not necessarily suggest that the pollutants are at levels considered hazardous to humans or aquatic life or that the water body segment cannot support beneficial uses. The intent of the 303(d) list is to identify the water body as requiring future development of a TMDL to maintain water quality and reduce the potential for continued water quality degradation. TMDLs have yet to be determined for most of the identified impaired water bodies, although a priority schedule has been developed to complete the process in the region by 2012. The Regional Water Quality Control Boards (RWQCBs) are responsible for developing strategies to attain compliance with the designated TMDLs. Many tributaries to and portions of San Francisco Bay and the Sacramento–San Joaquin Delta are listed as impaired water bodies on California’s 303(d) list and could be adversely affected by pollutants and other stressors that affect water quality. Figure 2.8-3 shows the location of Section 303(d) impaired water bodies in the Bay Area.

Figure 2.8-3
Impaired Water Bodies



National Pollutant Discharge Elimination System (Section 402 of the Clean Water Act)

Section 402 of the Clean Water Act established the National Pollutant Discharge Elimination System (NPDES) to regulate discharges into “navigable waters” of the United States. The RWQCBs monitor and enforce NPDES construction stormwater permitting in the Bay Area. The State Water Resource Control Board (SWRCB) administers the NPDES Permit Program through its General NPDES Permit. Construction activities of one acre or more are subject to the permitting requirements of the NPDES General Permit for Discharges of Storm Water Runoff Associated with Construction Activity (General Construction Permit). The project sponsor must submit a Notice of Intent to the SWRCB in order to be covered by the General Permit prior to the beginning of construction. The General Construction Permit requires the preparation and implementation of a stormwater pollution prevention plan (SWPPP), which must be prepared before construction begins. Components of SWPPPs typically include specifications for best management practices (BMPs) to be implemented during project construction for the purpose of minimizing the discharge of pollutants in stormwater from the construction area. In addition, a SWPPP includes measures to minimize the amount of pollutants in runoff after construction is completed, and identifies a plan to inspect and maintain project BMPs and facilities.

The 1987 Clean Water Act Amendments also requires municipalities and unincorporated communities to obtain NPDES permit coverage in order to control urban stormwater runoff. Municipal NPDES permits require the development and implementation of Storm Water Management Plans (SWMP), which include measures to reduce pollutants in stormwater to the maximum extent possible. Typical components of a SWMP include the identification of BMPs to reduce stormwater pollutant from new developments, both during and after completion of construction activities, and identification of measures to control increases in stormwater runoff resulting from development. Municipal stormwater permitting within the Bay Area is typically organized by county, as individual cities, towns, and unincorporated regions have joined together to better organize and coordinate stormwater management.

State Water Quality Certification Program (Sections 401 and 404 of the Clean Water Act)

The RWQCBs coordinate the State Water Quality Certification Program, or Section 401 of the Clean Water Act. Under Section 401, states have the authority to review any permit or license that will result in a discharge or disruption to wetlands and other waters under state jurisdiction, to ensure that the actions are consistent with the state’s water quality requirements. This program is most often associated with Section 404 of the Clean Water Act, which obligates the U.S. Army Corps of Engineers to issue permits for the movement of dredge and fill material into and from “waters of the United States.” Additionally, Section 404 requires permits for activities that affect wetlands or alter hydrologic features, such as wetlands, rivers, or ephemeral creek beds.

Section 10 of the Rivers and Harbors Act (33 U.S.C. 401 et seq.)

Section 10 of the Rivers and Harbors Act, administered by the U.S. Army Corps of Engineers (USACE), requires permits in navigable waters of the U.S. for all structures and activities. Navigable waters are defined as those subject to the ebb and flow of the tide and susceptible to use in their natural condition or by reasonable improvements as means of interstate transport or foreign commerce. USACE grants or denies permits based on the effects of navigation. Most activities covered under this act are also covered under Section 404 of the CWA.

Executive Order 11988—Floodplain Management (U.S. DOT Order 5650.2; 23 C.F.R. 650, Subpart A)

Executive Order (EO) 11988 directs all federal agencies to seek to avoid to the extent practicable and feasible all short-term and long-term adverse impacts associated with floodplain modification and to avoid direct and indirect support of development within 100-year floodplains whenever there is a reasonable alternative available. Projects that encroach upon 100-year floodplains must be supported with additional specific information. The U.S. Department of Transportation Order 5650.2, titled “Floodplain Management and Protection,” prescribes “policies and procedures for ensuring that proper consideration is given to the avoidance and mitigation of adverse floodplain impacts in agency actions, planning programs and budget requests.” The order does not apply to areas with Zone C (areas of minimal flooding as shown on Federal Emergency Management Agency [FEMA] Flood Insurance Rate Maps [FIRM]). Environmental review documents should indicate potential risks and impacts from proposed transportation facilities.

Flood Disaster Protection Act (42 U.S.C. 4001–4128; DOT Order 5650.2, 23 C.F.R. 650 Subpart A; and 23 C.F.R. 771)

The purpose of the Flood Disaster Protection Act is to identify flood-prone areas and provide insurance. The act requires purchase of insurance for buildings in special flood-hazard areas. The act is applicable to any federally assisted acquisition or construction project in an area identified as having special flood hazards. Projects should avoid construction in, or develop a design to be consistent with, FEMA-identified flood-hazard areas.

State Regulations

Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code)

The State of California’s Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code) provides the basis for water quality regulation within California, including providing for the State Water Resources Control Board (SWRCB) to implement the CWA for California.

California State Water Resources Control Board and Regional Water Quality Control Boards

The State Water Resources Control Board (SWRCB) administers water rights, water pollution control, and water quality functions throughout the state, while the Regional Water Quality Control Boards (RWQCBs) conduct planning, permitting, and enforcement activities. The primary responsibility for the protection and enhancement of water quality in California has been assigned by the California legislature to the SWRCB and the nine RWQCBs. The SWRCB provides state-level coordination of the water quality control program by establishing statewide policies and plans for the implementation of State and federal laws and regulations. The RWQCBs adopt and implement water quality control plans that recognize the unique characteristics of each region with regard to natural water quality, actual and potential beneficial uses, and water quality problems. The Bay Area encompasses portions of four separate RWQCBs: the North Coast Region, Central Coast Region, San Francisco Bay Region, and the Central Valley Region.

Both the SWRCB and U.S. Environmental Protection Agency (U.S. EPA) Region IX have been in the process of developing new water quality objectives and numeric criteria for toxic pollutants for California surface waters since 1994, when a State court overturned the SWRCB's water control plans containing water quality criteria for priority toxic pollutants. U.S. EPA's California Toxics Rule (CTR) was promulgated on May 18, 2000. The new criteria largely reflect the existing criteria contained in U.S. EPA's 304(a) Gold Book (1986) and its National Toxics Rule (NTR) adopted in December 1992 [57 Federal Register 60848], and those of earlier State plans (the Inland Surface Waters Plan and the Enclosed Bays and Estuaries Plan of April 1991, since rescinded). With the Final CTR, these federal criteria are legally applicable in the State of California for inland surface waters, enclosed bays and estuaries for all purposes and programs under the Clean Water Act.

California Department of Fish and Game Code (Section 1601–1603 [Streambed Alteration])

Under Sections 1601-1603 of the Fish and Game Code, agencies are required to notify the California Department of Fish and Game (CDFG) prior to implementing any project that would divert, obstruct, or change the natural flow or bed, channel, or bank of any river, stream, or lake.

Cobey-Alquist Flood Plain Management Act (Water Code Section 8400 et seq.)

The California Reclamation Board provides policy direction and coordination for the flood control efforts of state and local agencies along the Sacramento and San Joaquin Rivers and their tributaries in cooperation with USACE. It cooperates with various federal, State, and local government agencies in establishing, planning, constructing, operating, and maintaining flood-control works. The California Reclamation Board also exercises regulatory authority to maintain the integrity of the existing flood-control system and designated floodways by issuing permits for encroachments.

California Coastal Act

The California Coastal Commission was established by voter initiative in 1972 (Proposition 20) and made permanent by the legislature in 1976. The mission of the Commission, as the lead agency responsible for carrying out California's coastal management program, is to plan for and regulate development in the coastal zone consistent with the policies of the California Coastal Act. The Commission is also one of two designated state coastal management agencies established for the purpose of administering the federal Coastal Zone Management Act in California. The Bay Conservation and Development Commission (BCDC) has authority over federal activities and federally licensed or assisted activities within San Francisco Bay, many of which are not otherwise subject to state control. The California Coastal Commission has the same authority over federal activities and federally licensed or assisted activities elsewhere in the California coastal zone. The basic goals of the state for the coastal zone are to:

- Protect, maintain, and, where feasible, enhance and restore the overall quality of the coastal zone environment and its natural and artificial resources;
- Assure orderly, balanced use and conservation of coastal zone resources, taking into account the social and economic needs of the people of the state;

- Maximize public access to and along the coast and maximize public recreational opportunities in the coastal zone consistent with sound resource conservation principles and constitutionally protected rights of private property owners;
- Assure priority for coastal-dependent and coastal-related development over other development on the coast; and
- Encourage state and local initiatives and cooperation in preparing procedures to implement coordinated planning and development for mutually beneficial uses, including educational uses, in the coastal zone.

Regional and Local Regulations

General Plan Safety Elements

Government Code Section 65302, as amended (2007 Cal. Stat. 369) requires that on or after January 1, 2009, the updated safety elements of general plans must incorporate significantly enhanced geographic data, goals, and policies related to flood hazards. This enhanced assessment of flood hazards will include, but is not limited to: flood mapping information from multiple agencies including FEMA, the Army Corps of Engineers, the Office of Emergency Services, the Department of Water Resources, and any applicable regional dam, levee, or flood protection agencies; historical data on flooding; an inventory of existing and planned development (including transportation infrastructure) in flood zones; and new policies that comprehensively address existing and future flood risk in the planning area.

Bay Conservation and Development Commission (BCDC)

BCDC is described in *Chapter 2.3: Land Use and Housing*.

IMPACT ANALYSIS

SIGNIFICANCE CRITERIA

Implementation of the Transportation 2035 Plan would have a potentially significant adverse impact if Plan projects would:

- Criterion 1:** Violate any water quality standards or waste or storm water discharge requirements.
- Criterion 2:** Substantially interfere with or reduce rates of groundwater recharge due to the increased amount of impervious surfaces, such that there would be a net deficit in aquifer volume or a lowering of the groundwater table.
- Criterion 3:** Increase erosion by altering the existing drainage patterns of a site, contributing to sediment loads of streams and drainage facilities, and thereby affecting water quality.
- Criterion 4:** Increase non-point pollution of stormwater runoff due to litter, fallout from airborne particulate emissions, or discharges of vehicle residues, including petroleum hydrocarbons, and metals, that would impact the quality of receiving waters.
- Criterion 5:** Increase non-point-source pollution of stormwater runoff from construction sites due to discharges of sediment, chemicals, and wastes to nearby storm drains and creeks.
- Criterion 6:** Increase rates and amounts of runoff due to additional impervious surfaces, higher runoff values for cut-and-fill slopes, or alterations to drainage systems that could cause potential flood hazards and effects on water quality.
- Criterion 7:** Place within a 100-year flood hazard area structures which would impede or redirect flows.
- Criterion 8:** Expose people to a significant risk of loss, injury, or death involving flooding (including flooding as a result of the failure of a levee or dam), seiche, tsunami, or mudflow.

METHOD OF ANALYSIS

This is a program-level analysis of generalized potential impacts associated with hydrological resources in the San Francisco Bay Area. Project-specific studies would be necessary to determine the actual potential for significant impacts on hydrology and water quality resulting from implementation of transportation improvements in the Transportation 2035 Plan. However, some general impacts can be identified based on the nature of the transportation improvements. Impacts are determined for the Transportation 2035 Plan as a whole and for specific projects involving new construction. Projects are analyzed based upon their location relative to surface water bodies, 100-year floodplains, and impaired waterbodies. Those that conflict with these

resources in terms of water quality and also quantity are determined to potentially result in significant hydrologic impacts. Project analysis in relation to the coastal zone is provided in *Chapter 2.9: Biological Resources*.

SUMMARY OF IMPACTS

Projects that do not include the construction of infrastructure, such as bus line schedules or routes, local road maintenance, wheelchair curb ramps, or traffic light coordination would utilize existing transportation infrastructure and would not increase impervious surface area or alter groundwater recharge patterns. Potential changes to short- or long-term stormwater runoff originating from these facilities are therefore negligible. In contrast, other projects in the Transportation 2035 Plan would include the construction or expansion of interchanges, roadways, carpool lanes, bridges, tunnels, parking lots, or transit facility buildings. The creation of new impervious surfaces associated with these construction projects and the subsequent changes to the quality and volume of stormwater runoff could result in water quality impacts.

Direct Impacts

Implementation of transportation improvements in the Transportation 2035 Plan could result in both short-term and long-term impacts on water resources. Short-term impacts are temporary and generally related to construction activities, which could result in erosion and sedimentation effects on water bodies. Long-term effects are related to the intensification of regional urban uses associated with the expansion of roadways and other proposed transportation improvements, creating more impervious surfaces. Runoff from transportation facilities could increase non-point-source pollutant concentrations in stormwater regionally, as well as in groundwater basins. The paving required for highway projects could also decrease the amount of surface water that filters into the ground. In addition to water quality impacts, the Transportation 2035 Plan may also affect flooding, as increased runoff associated with paving may contribute to downstream flooding hazards and some projects are located in 100-year flood hazard areas.

Indirect/Cumulative Impacts

Indirect and cumulative impacts on water resources are associated with future planned urban development combined with transportation improvements that could have the potential to impact water quality, alter drainage patterns, create higher erosion rates and reduce groundwater recharge.

IMPACTS AND MITIGATION MEASURES

Impact

2.8-1 Construction of Transportation 2035 Plan projects could adversely affect water quality and drainage patterns in the short-term due to erosion and sedimentation. (Significant, mitigable)

Construction activities undertaken to implement transportation improvements in the Transportation 2035 Plan could include excavation, soil stockpiling, boring, and/or grading activities that create bare slopes as existing vegetation is stripped prior to the installation of impervious surfaces. Soil erosion is probable during construction, and the resulting water quality problems could include turbidity, increased algal growth, oxygen depletion, or sediment buildup,

thereby degrading aquatic habitats. Sediment from project-induced erosion could also accumulate in downstream drainage facilities and interfere with stream flow, thereby aggravating downstream flooding conditions.

Depending on the transportation project location, impacts from construction could affect local storm drain catch basins, culverts, flood control channels, streams, and San Francisco Bay. Most runoff in urban areas is eventually directed to either a storm drain or water body, unless allowed to stand in a detention area and filter into the ground. For this reason, even projects not directly adjacent to or crossing a sensitive area could have an impact.

Mitigation Measure

2.8(a) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce impacts on water resources that shall be considered by project sponsors and decision-makers may include, but are not limited to, those described below.

Project sponsors shall prepare and implement, as necessary, a Storm Water Pollution Prevention Plan (SWPPP) in accordance with the SWRCB's General Construction Permit. The SWPPP shall be consistent with the Manual of Standards for Erosion and Sedimentation Control by the Association of Bay Area Governments, the California Stormwater Quality Association (CASQA), Stormwater Best Management Practice Handbook for Construction, policies and recommendations of the local urban runoff program (city and/or county), and the recommendations of the RWQCB. Implementation of the SWPPP shall be enforced by inspecting agencies during the construction period via appropriate options such as citations, fines, and stop-work orders. Typical components of a SWPPP would include the following:

- Excavation and grading activities shall be scheduled for the dry season only (April 15 to October 15), to the extent feasible. This will reduce the chance of severe erosion from intense rainfall and surface runoff, as well as the potential for soil saturation in swale areas.
- If excavation occurs during the rainy season, storm runoff from the construction area shall be regulated through a stormwater management/erosion control plan that may include temporary on-site silt traps and/or basins with multiple discharge points to natural drainages and energy dissipaters. Stockpiles of loose material shall be covered and runoff diverted away from exposed soil material. If work is stopped due to rain, a positive grading away from slopes shall be provided to carry the surface runoff to areas where flow can be controlled, such as the temporary silt basins. Sediment basin/traps shall be located and operated to minimize the amount of offsite sediment transport. Any trapped sediment shall be removed from the basin or trap and placed at a suitable location on-site, away from concentrated flows, or removed to an approved disposal site.
- Temporary erosion control measures shall be provided until perennial revegetation or landscaping is established and can minimize discharge of sediment into nearby waterways. For construction within 500 feet of a water body, fiber rolls and/or gravel bags shall be placed upstream adjacent to the water body.

- After completion of grading, erosion protection shall be provided on all cut-and-fill slopes. Revegetation shall be facilitated by mulching, hydroseeding, or other methods and shall be initiated as soon as possible after completion of grading and prior to the onset of the rainy season (by October 15).
- Permanent revegetation/landscaping shall emphasize drought-tolerant perennial ground coverings, shrubs, and trees to improve the probability of slope and soil stabilization without adverse impacts to slope stability due to irrigation infiltration and long-term root development.
- BMPs selected and implemented for the project shall be in place and operational prior to the onset of major earthwork on the site. The construction phase facilities shall be maintained regularly and cleared of accumulated sediment as necessary.
- Hazardous materials such as fuels and solvents used on the construction sites shall be stored in covered containers and protected from rainfall, runoff, and vandalism. A stockpile of spill cleanup materials shall be readily available at all construction sites. Employees shall be trained in spill prevention and cleanup, and individuals should be designated as responsible for prevention and cleanup activities.

SWPPP(s) for projects immediately adjacent to or within drainages also will have to incorporate the following additional erosion control minimum criteria:

- Construction equipment shall not be operated in flowing water, except as may be necessary to construct crossings or barriers.
- Stream diversion structures shall be designed to preclude accumulation of sediment. If this is not feasible, an operation plan shall be developed to prevent adverse downstream effects from sediment discharges.
- Where working areas are adjacent to or encroach on live streams, barriers shall be constructed that are adequate to prevent the discharge of turbid water in excess of specified limits. The discharged water shall not exceed 110 percent of the ambient stream turbidity of the receiving water, if the receiving water is a flowing stream with turbidity greater than 50 nephelometric turbidity unit (NTU), or 5 NTU above ambient turbidity for ambient turbidities that are less than or equal to 40 NTU. If the water is discharged to a dry streambed, the discharged water shall not exceed 50 NTU.
- Material from construction work shall not be deposited where it could be eroded and carried to the stream by surface runoff or high stream flows.
- Riparian vegetation shall be removed only when absolutely necessary.

Implementation of this mitigation measure is expected to reduce the potentially significant impact on water resources to a level that is less than significant.

Impact

- 2.8-2 Transportation 2035 Plan projects could adversely affect water resources in the long term by reducing permeable surfaces, which could result in additional runoff and erosion, degrade water quality in receiving waters, decrease groundwater recharge, or alter drainage patterns. (Significant, mitigable)**

The Transportation 2035 Plan would result in the expansion or reconfiguration of roadways, creation of parking lots, construction of transit facilities, overall addition of impervious surface areas, and use of landscaping-related pesticides, herbicides, and fertilizers associated with maintenance of vegetation bordering roadways. Urban runoff can carry a variety of pollutants, such as oil and grease, metals, sediment, and pesticide residues from roadways, parking lots, rooftops, landscaped areas, and other surfaces, and deposit them in adjacent waterways. Pollutant concentrations in urban runoff are extremely variable and are dependent on storm intensity, land use, elapsed time between storms, and the volume of runoff generated in a given area that reaches receiving waters. The most critical time for urban runoff effects is in autumn under low flow conditions. Pollutant concentrations are typically highest during the first major rainfall event after the dry season, known as the “first flush.”

Because the Transportation 2035 Plan would increase the area of paved surfaces (roads, transit stations, park and ride lots, etc.), construction of the proposed projects combined with increased overall regional traffic could increase nonpoint-source pollutant concentrations in stormwater regionally. These nonpoint source pollutants could include oil and grease, petroleum hydrocarbons, and metals that would be transported by stormwater runoff to receiving water bodies. The paving required for highway projects could also have minor effects on the amount of surface water that filters into the ground, and groundwater basins could be affected by pollutants in the runoff from proposed transportation facilities.

In addition to potential water quality impacts, the Transportation 2035 Plan may also affect flooding. Floodplains are areas that are periodically inundated during high flows of nearby streams or high water levels in ponds or lakes. Natural floodplains offer wildlife and plant habitat, open space, and groundwater recharge benefits. Project construction could affect these floodplain values, including potentially redirecting flood waters, if not mitigated. Proposed transportation improvements that are directly adjacent to or cross a drainage facility or water body, or are located in 100-year flood hazard areas (see Table 2.8-1 at end of chapter), would have a greater potential impact on water resources than projects further from drainage facilities, water bodies, or 100-year flood hazard areas. Flood hazard areas are shown in Figure 2.8-2.

Mitigation Measure

2.8(b) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce impacts on water resources that shall be considered by project sponsors and decision-makers may include, but are not limited to, requiring projects to comply with design guidelines established in the Bay Area Stormwater Management Agencies

Association's (BASMAA) *Using Start at the Source to Comply with Design Development Standards* and the *California Storm Water Best Management Practice Handbook for New Development and Redevelopment* to minimize both increases in the volume and rate of stormwater runoff, and the amount of pollutants entering the storm drain system. Typical mitigation measures shall include the following:

Surface Water

- Drainage of roadway and parking lot runoff shall, wherever possible, be designed to run through grass median strips, contoured to provide adequate storage capacity and to provide overland flow, detention, and infiltration before it reaches culverts. Detention basins and ponds, aside from controlling runoff rates, can also remove particulate pollutants through settling. Facilities such as oil and sediment separators or absorbent filter systems shall therefore be designed and installed within the storm drainage system to provide filtration of stormwater prior to discharge and reduce water quality impacts whenever feasible. For example, runoff shall be filtered through mechanical or natural filtration systems such as pre-manufactured oil/water separators or through natural processes such as bioswales and settlement ponds to remove oil and grease prior to discharge.
- Long-term sediment control shall include an erosion control and revegetation program designed to allow reestablishment of native vegetation on slopes in undeveloped areas.
- In areas where habitat for fish and other wildlife would be threatened by transportation facility discharge, alternate discharge options shall be sought to protect sensitive fish and wildlife populations. Maintenance activities over the life of the project shall include heavy-duty sweepers, with disposal of collected debris in sanitary landfills to effectively reduce annual pollutant loads where appropriate. Catch basins and storm drains shall be cleaned and maintained on a regular basis.
- Landscaped areas shall use Integrated Pest Management techniques (methods that minimize the use of potentially hazardous chemicals for landscape pest control and vineyard operations). The handling, storage, and application of potentially hazardous chemicals shall take place in accordance with all applicable laws and regulations.

Groundwater

- Detention basins, infiltration strips, and other features to facilitate groundwater recharge shall be incorporated into the design of new freeway and roadway facilities whenever feasible.

Flooding

- Projects shall be designed so that they do not increase downstream flooding risks by increasing peak runoff volumes. Including detention ponds in designs for roadway medians, parking areas, or other facilities, or increasing the size of local flood control facilities serving the project areas could achieve this measure. Existing pervious surface shall be preserved to the maximum extent feasible to minimize increases in stormwater runoff volumes and rates.
- Projects shall be designed to allow lateral transmission of stormwater flows across transportation corridors with no increased risk of upstream flooding. Culverts and bridges

shall be designed to adequately carry drainage waters through project sites. The bottom of overpass structures should be elevated at least 1 foot above the 100-year flood elevation at all stream and drainage channel crossings.

- All roadbeds for new highway and rail transit facilities shall be elevated at least 1 foot above the 100-year base flood elevation.

Implementation of this mitigation measure is expected to reduce this potentially significant impact to a level that is less than significant.

Cumulative Impact

2.8-3 Transportation 2035 Plan projects, combined with projected regional development could contribute to degradation of regional water quality, reduction of groundwater recharge, or result in increased flooding hazards. (*Significant Cumulative Impact, Contribution Considerable, Mitigable*)

Implementation of transportation improvements in the Transportation 2035 Plan could result in cumulative impacts on water resources both directly by adding new impervious surface and by accommodating future planned urban development that could, when it occurs, have the potential to alter drainage patterns and impact water quality. The combination of Transportation 2035 Plan projects and new public and private infrastructure improvements serving future planned urban development could create higher erosion rates through increased impervious surfaces and consequently reduce groundwater recharge and increase the potential for flooding. Table 2.8-1 below identifies projects in the proposed Transportation 2035 Plan that overlap with a portion of the 100-year floodplain. New facilities located adjacent to these transportation improvements, perhaps because of them, may also create new susceptibility to flooding.

Overall, the potential for population growth and development to increase impervious surface, thereby degrading water quality, reducing recharge, and increasing flooding risk, is a significant cumulative impact. The larger portion of the cumulative impact is likely to be attributable to regional growth, due to the fact that many proposed Project improvements will occur in locations with existing impervious surface and existing flood risk (e.g. roadway and transit maintenance and operations projects, parking improvements, lane conversions, bike lane striping, etc). Nonetheless, as some transportation improvements could either increase impervious surface or increase new population and facilities vulnerable to flood by locating them or encouraging their location in the floodplain, the proposed Project has the potential to make a cumulatively considerable contribution to this impact.

Mitigation Measures

Despite feasible mitigation, the overall cumulative impact related to water quality and flood risk in the Bay Area is assumed to remain significant and unavoidable. However, the proposed Project's contribution to the overall significant cumulative impact is not cumulatively considerable with the implementation of the mitigation measures 2.8(a) and 2.8(b) provided above.

Part Two: Settings, Impacts, and Mitigation Measures
Chapter 2.8: Water Resources

Table 2.8-1: Plan Projects Located within the 100-Year Floodplain

<i>Project ID</i>	<i>Corridor</i>	<i>Project Description</i>
230345	Golden Gate	Rehabilitate or replace existing Healdsburg Avenue Bridge
22193	Golden Gate	Construct new bypass on Route 116 in Forestville
230689	Golden Gate	U.S. 101 in Sonoma County from Windsor River Road to Old Redwood Highway – widen to add HOT lane and convert HOV lanes to HOT lanes
22194	Golden Gate	*Improve safety on Mark West Springs/Porter Creek Road
22197	Golden Gate	Improve local circulation at various locations in Town of Penngrove
230701	Golden Gate	Widen U.S. 101 (adding an HOV lane in each direction) from Route 37 to Marin/Sonoma County line (Marin County portion) and from Marin/Sonoma County
230702	Golden Gate	U.S. 101 in Marin and Sonoma counties from Route 37 to Old Redwood Highway – convert HOV lanes to HOT lanes
22437	Golden Gate	Construct auxiliary lanes at various locations along U.S. 101
21315	Golden Gate	Signalize ramp intersections at U.S. 101/Miller Creek Road interchange
230688	Golden Gate	U.S. 101 in Marin County from Corte Madera to Route 37 – convert HOV lanes to HOT lanes
21325	Golden Gate	Improve local access to U.S. 101 from Tamalpais Drive to just north of Sir Francis Drake Boulevard
21030	Golden Gate	Improve U.S. 101/I-580 interchange (project approval and environmental design phases only)
94089	Golden Gate	*Reconstruct south access to the Golden Gate Bridge, from Doyle Drive to Broderick Street (design and construction phases)
98179	Golden Gate	Improve U.S. 101/Tiburon Boulevard interchange
230599	North Bay East-West	Implement Phase 2 improvements to Route 12 (Jamieson Canyon)
230508	Napa Valley	Elevate Solano Avenue from Yountville to Dry Creek Road
230499	Napa Valley	Construct bicycle/pedestrian path from Oak Circle to south Yountville town limit
230388	Napa Valley	*Improve the safety of the Oak Knoll/Silverado Trail intersection
230483	Napa Valley	Prepare Project Study Report (PSR) to improve Silverado Trail/Third/Coombsville/East and Silverado Trail intersection
230622	Napa Valley	Construct new bicycle/pedestrian trail through American Canyon
230659	Eastshore North	I-80 in Solano County from Yolo County line to Route 37 – widen to add HOT lane from Yolo County line to Air Base Parkway and from Red Top Road to Route 37
94151	Eastshore North	Construct 4-lane Jepson Parkway from Route 12 to Leisure Town Road
22700	Eastshore North	Construct parallel corridor north of I-80 from Red Top Road to Abernathy Road

Table 2.8-1: Plan Projects Located within the 100-Year Floodplain

<i>Project ID</i>	<i>Corridor</i>	<i>Project Description</i>
230468	Eastshore North	Provide auxiliary lanes on I-80 in eastbound and westbound directions from I-680 to Air Base Parkway
230660	Eastshore North	I-80 in Solano County from Red Top Road to Air Base Parkway – convert existing HOV lane to HOT lane
230658	Eastshore North	I-80 in Solano County from Route 37 to Carquinez Bridge – widen to add HOT lane
230657	Eastshore North	I-80 in Contra Costa County from Carquinez Bridge to Alameda-Contra Costa County line – convert existing HOV lanes to HOT lanes
230321	Eastshore North	Construct Phase 2 of Hercules Intermodal Station
230279	Eastshore North	Extend John Muir Parkway in Hercules
230318	Eastshore North	Extend North Richmond truck route along Soto Street from Market Avenue to Parr Boulevard
22355	Eastshore North	Modify I-80/Central Avenue interchange
230656	Eastshore North	I-80 in Alameda County from Alameda-Contra Costa County line to Bay Bridge – convert existing HOV lanes to HOT lanes
22089	Eastshore North	Improve Martinez Subdivision to include two additional mainline tracks
230306	Delta	Add a second southbound lane on Alhambra Avenue from Walnut Avenue to the south side of Highway 4
230690	Delta	I-680/Route 4 direct HOT connector in Contra Costa County – widen to add HOT lane
230654	Delta	Route 4 in Contra Costa County from Route 160 to Port Chicago Highway – convert existing HOV lanes to HOT lanes
98222	Delta	Construct freeway-to-freeway direct connectors between Route 4 Bypass and Route 160
230687	Diablo	I-680/I-80 direct HOT connector in Solano County – widen to add HOT lane
230686	Diablo	I-680 in Solano County from Benicia-Martinez Bridge to I-80 – widen to add HOT lane
22354	Diablo	Relocate the western half of the Marina Vista interchange off southbound I-680
230685	Diablo	I-680 in Contra Costa County from Alcosta Road to Benicia-Martinez Bridge – widen to add HOT lane and convert existing HOV lanes to HOT lanes
98133	Diablo	Widen Pacheco Boulevard to 4 lanes from Blum Road to Arthur Road
230216	Diablo	Construct 2-lane bridge connecting Waterworld Parkway with Meridian Park Boulevard
230308	Diablo	*Straighten curves to improve safety and operation of Alhambra Valley Road
230665	Tri-Valley	I-580 westbound in Alameda County from San Joaquin County line to I-680 – widen to add HOT lane and convert existing HOV lane to HOT lane

Part Two: Settings, Impacts, and Mitigation Measures
Chapter 2.8: Water Resources

Table 2.8-1: Plan Projects Located within the 100-Year Floodplain

<i>Project ID</i>	<i>Corridor</i>	<i>Project Description</i>
230684	Tri-Valley	Regional HOT Network: I-680/I-580 direct HOV connector - widen to add HOV
230086	Tri-Valley	Reconstruct I-580/Fallon Road interchange and I-580/Hacienda Drive interchange in Dublin
230667	Tri-Valley	I-580 eastbound in Alameda County from Greenville Road to Tassajara Road – convert HOV lane to HOT lane
230608	Tri-Valley	Construct a westbound auxiliary lane on I-580 between First Avenue and Isabel Avenue in the Tri-Valley area
22776	Tri-Valley	Widen Route 84 near Stanley Boulevard
21112	Sunol Gateway	*Improve Crow Canyon Road
230683	Sunol Gateway	I-680 in Contra Costa County from Route 84 to Alcosta Road – widen to add HOT lane
230682	Sunol Gateway	I-680 northbound in Alameda County from Santa Clara County line to Route 84 – widen to add HOT lane
22768	Eastshore South	*Retrofit and repair three Oakland-Alameda estuary bridges for seismic safety
22766	Eastshore South	Assess Fruitvale Avenue rail bridge for seismic retrofit
22783	Eastshore South	*Assess Fruitvale Avenue Bridge for seismic retrofit
230670	Eastshore South	I-880 in Alameda County from Marina Boulevard/Lewelling Boulevard to Hegenberger Road – convert HOV lanes to HOT lanes
230669	Eastshore South	I-880 in Alameda County from Alameda-Santa Clara County line to Marina Boulevard/Lewelling Boulevard – convert HOV lanes to HOT lanes
230053	Eastshore South	Reconstruct I-880 Industrial Parkway interchange (Phase I)
94506	Fremont South Bay	Construct an improved east-west connection between I-880 and Route 238 (Mission Boulevard) from North Fremont to Union City
230114	Fremont South Bay	Widen Auto Mall Parkway from 4 to 6 lanes between I-680 and I-880
22145	Silicon Valley	Widen westbound Route 237 on-ramp from Route 237 to northbound U.S. 101 to 2 lanes
230257	Silicon Valley	Convert HOV direct freeway connectors between I-880 and Route 237 to HOT direct freeway connectors
230298	Silicon Valley	Replace Calaveras Boulevard 4-lane bridge over the Union Pacific railroad tracks
230273	Silicon Valley	Widen Montague Expressway to 8 lanes between Trade Zone and I-680 and to 6 lanes between I-680 and Park Victoria
22965	Silicon Valley	Construct U.S. 101/Mabury Road/Taylor Street interchange
21722	Silicon Valley	Improve US 101 southbound Trimble Road/De La Cruz Boulevard/Central Expressway interchange
22815	Silicon Valley	Upgrade Miramonte Avenue bikeway to Class II between Mountain View and Foothill Expressway

Table 2.8-1: Plan Projects Located within the 100-Year Floodplain

<i>Project ID</i>	<i>Corridor</i>	<i>Project Description</i>
22179	Silicon Valley	Widen Central Expressway from 4 to 6 lanes between Lawrence Expressway and San Tomas Expressway
22883	Silicon Valley	Modify medians on Lawrence Expressway for limited access
22843	Silicon Valley	Widen Lawrence Expressway from 6 to 8 lanes between Moorpark Avenue/Bollinger Road and south of Calvert Cour
22186	Silicon Valley	Widen San Tomas Expressway to 8 lanes between El Camino Real (Route 82) and Williams Road
230210	Silicon Valley	*Rebuild box culvert under San Tomas Expressway
22895	Silicon Valley	Improve the operations of San Tomas Expressway/Route 17 interchange
230242	Silicon Valley	Add Capitol Expressway Traffic Operations System (TOS) between U.S. 101 and Almaden Expressway
22175	Silicon Valley	Widen Almaden Expressway to 8 lanes between Coleman Road and Blossom Hill Road
22910	Silicon Valley	Add Traffic Operations System (TOS) infrastructure on Santa Teresa Boulevard between Day Road and Mesa Road
22842	Silicon Valley	Improve Route 152/Ferguson Road intersection
21549	Peninsula	Implement direct access route from Hunters Point Shipyard to U.S. 101
22756	Peninsula	Reconstruct U.S. 101/Candlestick Point interchange
22226	Peninsula	Construct Bayshore Intermodal Facility for Caltrain, Muni light rail, and Muni and SamTrans buses
21604	Peninsula	Construct auxiliary lanes (one in each direction) on U.S. 101 from Sierra Point to San Francisco County line
21623	Peninsula	Improve Caltrain stations
21610	Peninsula	Construct auxiliary lanes (one in each direction) on U.S. 101 from San Bruno Avenue to Grand Avenue
22239	Peninsula	Widen Manor Drive overcrossing over Route 1
98204	Peninsula	Add travel lane (one in each direction) on Route 1 (Calera Parkway) between Fassler Avenue and Westport Drive in Pacifica
230664	Peninsula	U.S. 101 in San Mateo County from Whipple Avenue to Millbrae – widen for new HOT lane
21602	Peninsula	Reconstruct U.S. 101/Broadway interchange
21893	Peninsula	Widen Route 92 from Half Moon Bay city limits and Pilarcitos Creek
230663	Peninsula	U.S. 101 in San Mateo County from San Mateo/Santa Clara County line to Whipple Avenue – convert existing HOV lanes to HOT lanes
21612	Peninsula	Improve access to/from west side of Dumbarton Bridge on Route 84 connecting to U.S. 101
230211	San Francisco	Extend trolley coach infrastructure into Mission Bay along 16th Street and Third Street and implement transit signal priority along 16th Street and Fillmore Street

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Table 2.8-1: Plan Projects Located within the 100-Year Floodplain

<i>Project ID</i>	<i>Corridor</i>	<i>Project Description</i>
22462	San Francisco	Implement bicycling programs, including construction and rehabilitation of bicycle lanes and paths; improve signage and crossings; and implement a public awareness campaign
230164	San Francisco	Implement a Bus Rapid Transit (BRT) project on Geary Boulevard
230168	San Francisco	Improve the Great Highway between Lincoln Way and 48th Avenue
230594	San Francisco	Improve San Francisco BART stations to enhance passenger safety, accessibility and capacity, improve signage and provide real time transit information
230207	San Francisco	Implement a Bus Rapid Transit (BRT) project on the Geneva Avenue/Harney Way corridor
230490	San Francisco	Reconstruct and widen Harney Way to 8 lanes
230672	Transbay	Route 92 in Alameda County from Clawiter Road through San Mateo-Hayward Bridge toll plaza – convert HOV lanes to HOT lanes
230673	Transbay	Route 84 in Alameda County from I-880 through Dumbarton Bridge toll plaza – convert HOV lanes to HOT lanes
22676	Region Wide Projects	Improve passenger capacity at 43 BART stations

* Projects that are part of the Heavy Maintenance/Climate Protection Emphasis alternatives

Source: Environmental Science Associates, 2008

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2.9 Biological Resources

This chapter outlines the biological resources (plants, wildlife and wetlands) of the Bay Area, describing various habitat types, associated rare, threatened and endangered (special-status) species, and areas of ecological significance found in the region. The potential effects of the proposed Transportation 2035 Plan on sensitive species and habitats, and the fragmentation of existing habitats are identified. The analysis presented is regional in scope, as appropriate for a program-level EIR. The assessment is intended to assist area-wide issue identification as it relates to regional transportation planning.

ENVIRONMENTAL SETTING

PHYSICAL SETTING

Ecosystems in the Bay Area

The Bay Area supports an extensive diversity of distinct vegetative communities. Broad habitat categories in the region generally include coastal scrubs, oak woodlands, grasslands, estuaries, coastal salt marshes, riparian habitats, eucalyptus groves, urban areas, interior wetlands, rivers and streams, and the San Francisco Bay. Urban areas, interior wetlands, estuaries, rivers and streams, and the San Francisco Bay are not vegetation communities per se, but provide natural functions and values as wildlife habitat and are considered in this EIR.¹ Due to the amount of native vegetation lost to urbanization throughout California, the California Department of Fish and Game (CDFG) identifies several specific native vegetative communities as rare and/or sensitive. These natural communities are of special significance because the present rate of loss indicates that additional acreage reductions or further habitat degradation may threaten the viability of dependent plant and wildlife species and possibly hinder the long-term sustainability of the community or species dependent upon the community.

Some of these natural communities have a rich complement of sensitive species and species-oriented programs that will usually protect them. Other communities do not support rare species and, therefore, species-oriented protection cannot be invoked. Sensitive communities in the Bay Area include coastal salt marsh, freshwater wetlands, and mixed oak woodlands (coast live oak occurs as an upland and riparian community within the Bay Area).² Following are descriptions of the major natural communities in the Bay Area.

¹ Natural communities are compositions of species that reoccur due to responses to similar combinations of environmental conditions and are not dependent on human intervention. For this discussion, native vegetation pertains to those species present in California prior to European colonization, while species such as wild oats and brome grasses, which dominate much of the current California landscape, are considered non-native. Vegetation communities that are dependent on human intervention, such as horticultural species, irrigated agriculture, or landscaped or urbanized areas, are considered introduced communities.

² The CDFG and California Native Plant Society recognize uncommon, vulnerable, or regionally declining habitat types as sensitive or significant communities. These communities are tracked by the CDFG in the California Natural Diversity Data Base. Each

Coastal Scrub and Chaparral

Natural Community Summary

The coastal scrub and sage scrub plant communities in the Bay Area are recognized on the basis of the dominant species: California buckwheat (*Eriogonum fasciculatum*), black sage (*Salvia mellifera*), California sagebrush (*Artemisia californica*), coyote brush (*Baccharis pilularis*), mixed sage (*Salvia* spp.), and purple sage (*Salvia* spp.) series³. They are particularly dominant in the drier southern slopes and on exposed rocky slopes and bluffs within the Coast Ranges in the Bay Area. The coastal scrub is best considered as a collection or assemblage of different vegetation series, with various intergrades between the above-described plant communities. The coastal sage scrubs mix with various coastal terrace forests, grasslands, chaparrals, and foothill woodlands and are common in Marin, San Francisco, and San Mateo Counties near travel corridors. A similar chaparral habitat occurs in the Diablo Range in Contra Costa and Alameda Counties, but maintains many of the same basic vegetative elements. Vegetation mosaics can be controlled by the soil type, slope exposure, and summer fog. Generally, these are communities of dense, low shrubs with scattered grassy openings. Most growth and flowering occur in late spring and early summer.

Rare Plants

The distribution of rare plants and wildlife in this community often coincides with the distribution of uncommon geological features. In the case of coastal scrub plant communities, an array of plants and wildlife have adapted to serpentine-derived soils in both scrub habitats and grasslands. Such habitats may occur as individual rock outcrops on hillsides or steeper talus slopes, or as moderately sloped hillsides and alluvial deposits. Special-status serpentine-adapted scrub species include: coyote ceanothus (*Ceanothus ferrisiae*), Presidio clarkia (*Clarkia franciscana*), Mt. Diablo bird's beak (*Cordylanthus nidularius*), Marin checker lily (*Fritillaria affinis* var. *tristulis*), fragrant fritillary (*Fritillaria liliacea*), Crystal Springs lessingia (*Lessingia arachnoidea*), smooth lessingia (*Lessingia micradenia* var. *glabrata*), Marin checkerbloom (*Sidalcea hickmanii* var. *viridis*), San Francisco campion (*Silene verecunda* var. *verecunda*), and Tamalpais jewel-flower (*Streptanthus batrachopus*). Those plants not specifically adapted to serpentine habitats include: San Francisco Bay spineflower (*Chorizanthe cuspidata* var. *cuspidata*), woolly-headed spineflower (*Chorizanthe cuspidata* var. *villosa*), yellow larkspur (*Delphinium luteum*), supple daisy (*Erigeron supplex*), Mt. Diablo buckwheat (*Eriogonum truncatum*), coast wallflower (*Erysimum ammophilum*), robust monardella (*Monardella villosa* var. *globosa*), Marin County navarretia (*Navarretia rosulata*), north coast phacelia (*Phacelia insularis* var. *continentis*), and Metcalf Canyon jewel flower (*Streptanthus albidus* ssp. *albidus*). Generalized habitat for special-status plant and wildlife species listed in this section, and their listing status is provided in Table D-1 in Appendix D.

community appearing in the database is assigned a rarity and threat ranking that indicates current known acreage of the community, known threats, and the community's sensitivity to perturbation.

³ Sawyer and Keeler-Wolf, 1995.

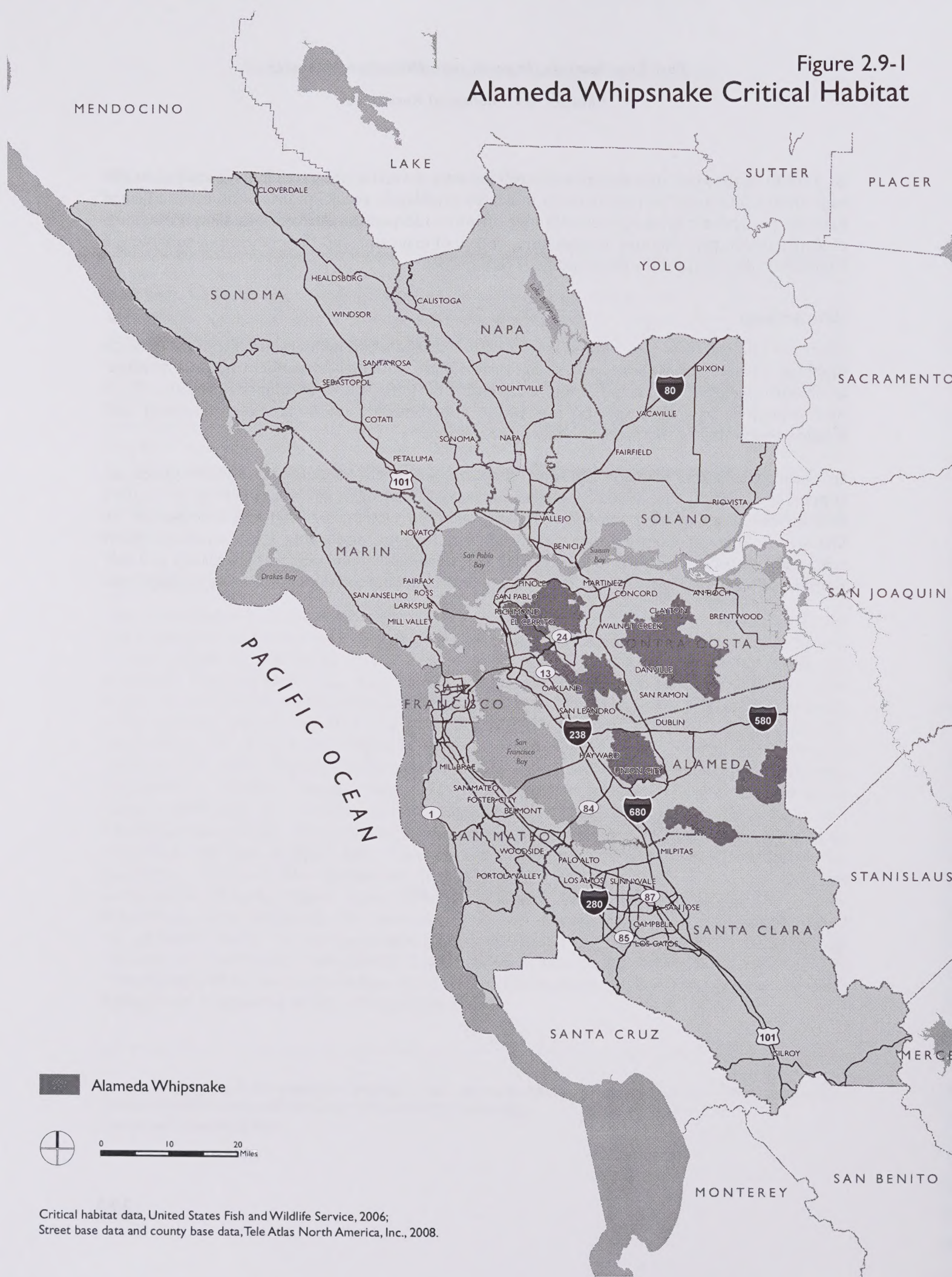
As a result of the vegetative mosaics in scrub habitats, several of the rare plants described in this vegetation community frequently occur in nearby grasslands, coastal prairies, and other adjacent habitats, particularly those species with high affinity to serpentine-derived soils. Conditions such as slope, aspect, precipitation, temperature, degree of exposure, and the presence of suitable soil conditions often control the distribution of rare species.

Rare Animals

There are relatively few rare wildlife species within coastal scrub habitats, and these are typically highly specialized invertebrates whose life histories are intimately dependent upon serpentine-associated species. These include callippe silverspot butterfly (*Speyeria callippe callippe*) and two non-serpentine-dependent species, San Bruno elfin butterfly (*Incisalia mossii bayensis*), and mission blue butterfly (*Icaricia icarioides missionensis*).

In Contra Costa and Alameda Counties, chaparral and scrub habitats and adjacent grasslands support the federally threatened Alameda whipsnake (*Masticophis lateralis euryxanthus*). Critical habitat was designated for the Alameda whipsnake on October 3, 2000 and redesignated on October 2, 2006 in Contra Costa, Alameda, San Joaquin, and Santa Clara counties, where whipsnake distribution coincides closely with chaparral habitat and adjacent grasslands and oak-dominated habitats (Figure 2.9-1). This species' critical habitat includes portions of the Bay Area.

Figure 2.9-1
Alameda Whipsnake Critical Habitat



Critical habitat data, United States Fish and Wildlife Service, 2006;
Street base data and county base data, Tele Atlas North America, Inc., 2008.

Grasslands

Natural Community Summary

Grasslands within the Bay Area include generally three community types: the non-native grasslands, and the less common serpentine bunchgrass and valley needlegrass grasslands⁴. Non-native annual grasslands occur throughout the Bay Area and consist of a dense to sparse cover of annual grasses associated with a variety of broadleaf herbs and perennial grasses. The most abundant species are generally non-native annual grasses in the genera *Bromus*, *Avena*, *Lolium*, and *Vulpia*. Common broadleaf species are quite variable, but often include filaree (*Erodium* sp.), yellow-star thistle (*Centaurea* sp.), lupines (*Lupinus* sp.), peppergrass (*Lepidium* sp.), Indian paintbrush (*Castilleja* sp.), and California poppy (*Eschscholzia californica*). In addition to considerable site-to-site variation that is largely based on soils and management practices, there is also much year-to-year variation in species composition in response to the timing and amount of precipitation. In a standard reference on California vegetation, the non-native annual grassland community is equivalent to the California annual grassland series⁵.

Serpentine bunchgrass and valley needlegrass grasslands are both native vegetation communities with limited distribution in the Bay Area. The former community is limited due to its dependency upon serpentine sites, which are scattered throughout the Coast Ranges. This habitat is known to occur within the Golden Gate corridor, particularly in Marin County, and in the Peninsula corridor near I-280. This open grassland community is dominated by native perennial bunchgrasses of the genera *Bromus*, *Melica*, *Nassella*, *Poa*, *Calamagrostis*, and *Festuca*. Native herbaceous species on this habitat type include California poppy, tarweed (*Hemizonia* sp.), and lotus (*Lotus* sp.). Valley needlegrass grasslands usually occur on seasonally moist, fine-textured soils and often intergrade with oak woodland communities. This formerly extensive grasslands habitat is dominated by clump-forming purple needlegrass (*Nassella pulchra*) and a variety of native and introduced grasses and herbs.

Reptile species typically found in this habitat include western fence lizard (*Sceloporus occidentalis*), western terrestrial garter snake (*Thamnophis elegans*), and western rattlesnake (*Crotalus viridis*). Mammals within this habitat include black-tailed jackrabbit (*Lepus californicus*), western harvest mouse (*Reithrodontomys megalotis*), California vole (*Microtus californicus*), and coyote (*Canis latrans*). Principal game species in this habitat type include blacktail deer (*Odocoileus hemionus*), California quail (*Lophortyx californicus*), and mourning dove (*Zenaida macroura*). Typical foraging birds include the turkey vulture (*Cathartes aura*), northern harrier (*Circus cyaneus*), American kestrel (*Falco sparverius*), and white-tailed kite (*Elanus leucurus*).

⁴ Holland, 1986.

⁵ Sawyer and Keeler-Wolf, 1995.

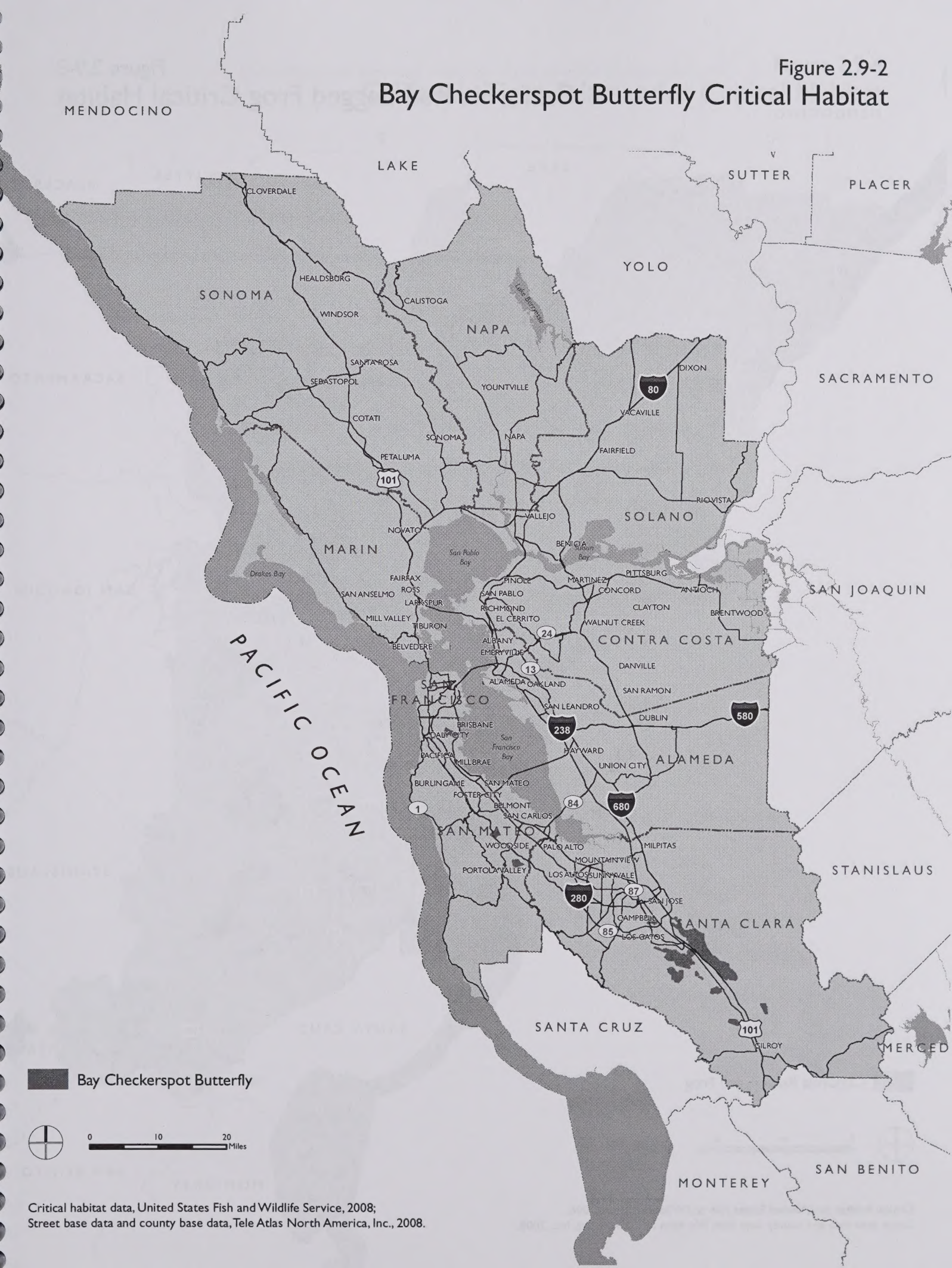
Rare Plants

Special-status plant species that occur in specialized habitat within grasslands include white-rayed pentachaeta (*Pentachaeta bellidiflora*), San Francisco popcorn flower (*Plagiobothrys diffusus*), showy madia (*Madia radiata*), most beautiful jewel-flower (*Streptanthus albidus* ssp. *peramoenus*), Tiburon jewel-flower (*Streptanthus niger*), Tiburon Indian paintbrush (*Castilleja affinis* ssp. *neglecta*), Tamalpais lessingia (*Lessingia micradenia* var. *micradenia*), Contra Costa goldfields (*Lasthenia conjugens*), fountain thistle (*Cirsium fontinale* var. *fontinale*), Carquinez goldenbush (*Isocoma arbuta*), Santa Cruz tarplant (*Holocarpha macradenia*), Marin western flax (*Hesperolinon congestum*), Brewer's western flax (*Hesperolinon breweri*), Diablo helianthella (*Helianthella castanea*), diamond-petaled California poppy (*Eschscholzia rhombipetala*), caper-fruited tropidocarpum (*Tropidocarpum capparideum*), and recurved larkspur (*Delphinium recurvatum*). Most of these species may also occur in vegetation communities other than grassland with their distribution generally restricted to specific soil types, hydrologic regimes, elevation range, and geographic distribution.

Rare Animals

Special-status wildlife species associated with grassland habitats of the Bay Area include: Bridge's coast range shoulderband snail (*Helminthoglypta nickliniana bridgesi*), callippe silverspot butterfly (*Speyeria callippe callippe*), mission blue butterfly (*Icaricia icarioides missionensis*), bay checkerspot butterfly (*Euphydryas editha bayensis*), Edgewood blind harvestman (*Calicina minor*), California tiger salamander (*Ambystoma californiense*), western spadefoot toad (*Scaphiopus hammondi*), California red-legged frog (*Rana draytonii*) (discussed under *Riparian* habitat, below), Alameda whipsnake (*Masticophis lateralis euryxanthus*), San Joaquin whipsnake (*Masticophis flagellum ruddocki*), white-tailed kite (*Elanus leucurus*), golden eagle (*Aquila chrysaetos*), burrowing owl (*Athene cunicularia*), loggerhead shrike (*Lanius ludovicianus*), California horned lark (*Eremophila alpestris*), and San Joaquin kit fox (*Vulpes macrotis mutica*). Critical habitat is designated for several special-status grassland species, including the bay checkerspot butterfly, California red-legged frog, and California tiger salamander. US Fish and Wildlife Service (USFWS) designated critical habitat for the bay checkerspot butterfly on April 30, 2001, and redesignated critical habitat for this species on August 26, 2008 (Figure 2.9-2). USFWS designated critical habitat for the California red-legged frog on April 13, 2006 (see Figure 2.9-3). Critical habitat for the central population of the California tiger salamander was redesignated on August 23, 2005 (Figure 2.9-4). The San Francisco Bay Area includes critical habitat for all of these species.

Figure 2.9-2
Bay Checkerspot Butterfly Critical Habitat



Bay Checkerspot Butterfly



Critical habitat data, United States Fish and Wildlife Service, 2008;
Street base data and county base data, Tele Atlas North America, Inc., 2008.

Figure 2.9-3
California Red-Legged Frog Critical Habitat



Figure 2.9-4
California Tiger Salamander Critical Habitat



California Tiger Salamander



Critical habitat data, United States Fish and Wildlife Service 2005;
Street base data and county base data, Tele Atlas North America, Inc., 2008.

Woodlands

Natural Community Summary

Mixed oak woodlands are often composed of coast live oak, California black oak (*Quercus kelloggii*), valley oak (*Quercus lobata*), toyon (*Heteromeles arbutifolia*), and California buckeye (*Aesculus californica*). In this discussion, these woodlands are grouped with broad-leaved upland forests on steep north-facing slopes, which may additionally include big-leaf maple (*Acer macrophyllum*) and California bay (*Umbellularia californica*). The understory is dominated by herbaceous vegetation and consists of non-native grasses such as soft chess (*Bromus mollis*) and ripgut grass (*Bromus diandrus*), intermixed with native and non-native wildflowers including mission bells (*Fritillaria affinis*), chickweed (*Stellaria media*), bedstraw (*Galium aparine*), mugwort (*Artemisia douglasiana*), fiesta flower (*Pholistoma auritum*), and miner's lettuce (*Claytonia perfoliata*). The shrub layer of the understory, though sparse, often contains snowberry (*Symphoricarpos albus*), poison oak (*Toxicodendron diversilobum*), and California blackberry (*Rubus ursinus*). This community often occurs as an open savanna habitat, as seen near US 101 in Sonoma County, I-80 in Solano County, near the State Route 4 (bypass) corridor, but also as dense, closed canopy forests as seen near I-280 in San Mateo County (Peninsula corridor) and south of I-580 between the cities of Hayward and Pleasanton (I-580 corridor). These wooded communities frequently intergrade with adjacent habitats, such as between oak savannas and adjacent grasslands or chaparral, and between forested areas and riparian plant communities.

Coast live oak woodland provides water, foraging, nesting, cover, and migrating and dispersal corridors for a variety of wildlife species. Insect eaters such as ash-throated flycatcher (*Myiarchus cinerascens*), plain titmouse (*Baeolophus inornatus*), and dark-eyed junco (*Junco hyemalis*) are woodland foliage gleaners. Bark gleaner species, such as scrub jay (*Aphelocoma californica californica*), Stellar's jay (*Cyanocitta stelleri*), and acorn woodpecker (*Melanerpes formicivorus*), feed on insects as well as acorns. California quail and California towhee (*Pipilo crissalis*) are the ground foliage gleaners in this habitat. Cooper's hawk (*Accipiter cooperii*) and sharp-shinned hawk (*A. striatus*) are often associated with this habitat, where they hunt small birds. Mammals such as gray squirrel (*Sciurus griseus*) forage and nest in the canopy of the trees, while long-tailed weasels (*Mustela frenata*) hunt on the ground for shrews (*Sorex* sp.) and California voles (*Microtus californicus*). Larger mammals such as blacktailed deer (*Odocoileus hemionus*) utilize the wet understory of this community (i.e., poison oak and blackberry) in the form of shelter and food from the berries. Amphibians such as Pacific slender salamander (*Batrachoseps attenuatus*), rough-skinned newt (*Taricha granulosa*), and ensatina (*Ensatina eschscholtzii*) live under the cover of fallen leaf litter.

Rare Plants

Special-status plant species associated with woodland habitats are often also found in adjacent chaparral and scrub habitats. In the Bay Area these species include: rayless ragwort (*Senecio aphanactis*), hooked popcorn-flower (*Plagiobothrys uncinatus*), Mt. Diablo phacelia (*Phacelia phacelioides*), Baker's navarretia (*Navarretia leucocephala* ssp. *bakeri*), showy madia (*Madiaradiata*), Mt. Hamilton lomatium (*Lomatium observatorium*), Jepson's linanthus (*Linanthus jepsonii*), coast lily (*Lilium maritimum*), Contra Costa goldfields (*Lasthenia*

conjugens), drymaria-like western flax (*Hesperolinon drymarioides*), Diablo helianthella (*Helianthella castanea*), talus fritillary (*Fritillaria falcata*), Hillsborough chocolate lily (*Fritillaria biflora* var. *ineziana*), San Mateo woolly sunflower (*Eriophyllum latilobum*), Brandegee's eriastrum (*Eriastrum brandegeae*), Santa Clara Valley dudleya (*Dudleya setchellii*), western leatherwood (*Dirca occidentalis*), Hospital Canyon larkspur (*Delphinium californicum* ssp. *interius*), Robust spineflower (*Chorizanthe robusta* var. *robusta*), big-scale balsamroot (*Balsamorhiza macrolepis* var. *macrolepis*), Marin manzanita (*Arctostaphylos virgata*), pallid manzanita (*Arctostaphylos pallida*), large-flowered fiddleneck (*Amsinckia grandiflora*), and Sharsmith's onion (*Allium sharsmithae*).

Rare Animals

Special-status wildlife species include those described for grassland and riparian habitats in addition to purple martin (*Progne subis*), forest-nesting raptors, and other nesting birds such as tree swallow (*Tachycineta bicolor*), and Bullock's oriole (*Icterus bullockii*). These species are protected under the Migratory Bird Treaty Act.

Eucalyptus Grove

Natural Community Summary

This vegetation community is usually monotypic, with only one species providing canopy and little undergrowth. However, eucalyptus groves gradually establish dominance over and crowd out native plant communities as they expand. Structurally, eucalyptus (*Eucalyptus* sp.) creates a dense, shady canopy. Volatile chemicals contained in the bark and leaf litter that is deposited by eucalyptus creates poor growing conditions for most herbaceous and woody understory species and may suppress the germination of native seeds. Where fire hazard management techniques have not been applied, the understory of this community consists of a thick layer of bark, leaves, and poison oak (where openings in the canopy allow sufficient light to penetrate to the grove floor), which in turn creates a high fire hazard.

These forests offer perching and roosting sites for a variety of avian species, with raptors often nesting in the groves. The lack of understory growth limits habitat for insects and other invertebrates and thus for the reptiles that prey upon them. Likewise, mammals do not regularly use this habitat, except for cover and resting areas. However, *Myotis* bat species and California slender salamanders (*Batrachoseps attenuatus*) have been observed in this habitat.

Rare Plants and Animals

Other than nesting raptors, no special-status plant or wildlife species are typically associated with pure eucalyptus groves.

Urban/Highly-Disturbed

Natural Community Summary

This community type is designated for areas occupied by buildings, roads, parking lots, and other developed facilities, as well as adjacent landscaped or heavily disturbed areas. Vegetation in these areas (other than landscaping plants) consists mostly of non-native species such as bottlebrush (*Callistemon rigidus*), and cultivated native species such as Monterey pine (*Pinus radiata*), coast redwood (*Sequoia sempervirens*), eucalyptus, coast live oak, and lemonadeberry (*Rhus integrifolia*). Urban and developed areas tend to be landscaped with non-native ornamental plant species, thus displacing native plants. Developed and ornamental landscaping occurs is prevalent throughout the Bay Area, particularly in urban, commercial, and residential areas.

Residential developments and other areas with ornamental landscaping can provide some habitat for wildlife species adapted to human habitation, such as striped skunk, Virginia opossum (*Didelphis virginiana*), raccoon, and a variety of bird species including European starling (*Sturnus vulgaris*), American robin (*Turdus migratorius*), Anna's hummingbird (*Calypte anna*), house finch (*Carpodacus mexicanus*), English sparrow (*Passer domesticus*), and mourning dove. In addition, several bat species may roost in buildings or trees in these urban areas, and larger trees may provide roosting and nesting habitat for raptors and other birds.

Rare Plants

Urban/highly-disturbed areas are unlikely to have rare plants, because by definition these areas have highly disturbed, nonnative vegetation, if there is any vegetation at all.

Rare Animals

Other than nesting raptors and roosting bats, no special-status plant or wildlife species are typically associated with urban areas.

Riparian

Natural Community Summary

Riparian plant communities are tree- or shrub-dominated communities that occur along streams and rivers. Riparian forests, woodlands, and scrub are often separated from one another depending on the amount and density of tree canopy versus shrub canopy. Forests support a closed or nearly closed canopy of trees with variable understory, while woodlands have an open canopy of trees with an understory that is primarily grassy or herbaceous. Shrubs rather than trees dominate riparian scrub habitat. The composition and density of riparian vegetation is very much dependent upon the duration of flowing or near-surface water, the amplitude and periodicity of flow (brief, high-velocity flows versus more sustained flows), and the texture of the substrate (cobble, gravel, sand, silt, clay). Different reaches of a stream may support different types of riparian vegetation. The most well developed riparian vegetation occurs on the largest Bay Area streams, such as Sonoma Creek, the Napa River, Putah Creek, Alameda Creek, Coyote Creek, the Guadalupe River, San Francisquito Creek, Llagas Creek, and others listed in Table 2.9-

1. The major rivers, streams, and other surface waters that support riparian vegetation in the Bay Area are presented in Chapter 2.8 in this EIR.

Typical dominant species in the forests, woodlands, and scrubs along these rivers are Fremont cottonwood (*Populus fremontii*), California sycamore (*Platanus racemosa*), various species of willow (*Salix* spp.), coast live oak (*Quercus agrifolia*) and white alder (*Alnus rhombifolia*). Vegetation series represented in riparian vegetation of the Bay Area include Fremont cottonwood, arroyo willow (*S. lasiolepis*), as well as coast live oak and canyon live oak series. Where not modified by urbanization, lower reaches of the above-described streams typically intergrade into broad freshwater emergent wetlands dominated by cattails and bulrush (*Scirpus* spp.). Where the riparian habitat has been degraded, either through alteration of the hydrology or direct disturbance to the vegetation, the non-native blue gum eucalyptus (*Eucalyptus globulus*), fennel (*Foeniculum vulgare*), giant reed (*Arundo donax*), or French broom (*Genista monspessulana*) are often dominant, as seen in portions of most large Bay Area streams. Most remaining high-quality riparian vegetation is afforded regulatory protection by CDFG. A discussion of specific regulations is provided in Appendix F.

Within the urbanized portions of the Bay Area, riparian habitats support the densest and most diverse wildlife communities available. The diversity of plant species, multilayered vegetation, and perennial water provides a variety of foods and microhabitat conditions for wildlife. Mature willows, oaks, sycamores, and other riparian trees provide high-quality nesting habitat for wildlife.

Table 2.9-1: Major Rivers and Creeks in the Bay Area

<i>North San Francisco Bay</i>	
Marin County	Solano County
Gallinas Creek	Napa River*
Novato Creek*	Green Valley Creek*
Corte Madera Creek*	Putah Creek*
Miller Creek*	Suisun Creek*
Lagunitas Creek*	Sonoma County
Napa County	Sonoma Creek*
Napa River*	Petaluma River*
Huichica Creek*	Santa Rosa Creek*†
	Russian River*†
<i>East San Francisco Bay</i>	
Alameda County	Contra Costa County
San Leandro Creek*	San Pablo Creek*
Alameda Creek*	
San Lorenzo Creek*	
<i>South San Francisco Bay</i>	
Santa Clara County	
Coyote Creek*	
Guadalupe River*	
Stevens Creek*	
Permanente Creek	
Adobe Creek	
San Francisquito Creek*	
Los Gatos Creek*	
Llagas Creek* (drains to the Pacific Ocean via the Pajaro River)	
<i>San Francisco Peninsula</i>	
San Mateo County	San Francisco City and County
Cordilleras Creek	None
San Mateo Creek*	
Sanchez Creek	

* Recent records of steelhead presence

† Recent records of Chinook salmon presence

Source: Environmental Science Associates, 2008

Rare Animals

The federally threatened California red-legged frog still breeds in the upper reaches of most Bay Area riparian corridors and in the lower reaches within select drainage systems and ponds. The greatest concentrations of this species in the Bay Area occur near Sears Point (North Bay east-west corridor), several drainages and channels that traverse I-580 in the Livermore-Amador Valley (I-580 corridor), and in drainages on the San Francisco Peninsula (Peninsula corridor), though potential habitat may occur elsewhere.

The foothill yellow-legged frog (*Rana boylei*) occurs in the upper, rocky reaches of some North Bay and inner Coast Ranges streams (e.g., at Sunol Regional Park). Due to the absence of Rocky Mountain streams in the Bay Area, this species is not expected in any of the Bay Area's travel corridors. The federal and State-listed endangered San Francisco garter snake (*Thamnophis*

sirtalis tetrataenia) occurs on the San Francisco Peninsula, where riparian habitats meet open water and freshwater marshlands. Habitats within the Peninsula corridor occur in marshlands near San Francisco International Airport (US 101) and in tributary streams to the Crystal Springs Reservoir (I-280). Riparian habitats in the Bay Area may also support small populations of western pond turtle (*Actinemys marmorata*). The federally threatened valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) is dependent upon the elderberry bush (*Sambucus* sp., usually *mexicana*) throughout its entire life history. Elderberry bushes occur statewide and commonly occur in riparian corridors, but may also be present in isolated stands or in woodlands outside riparian habitats. The range of the valley elderberry longhorn beetle includes portions of Solano County (I-80 corridor) and eastern Contra Costa and Alameda counties.

Rivers and Streams

Natural Community Summary

Rivers and streams of the Bay Area have several common ecological attributes:

- As a result of urbanization, many smaller streams on the San Francisco Peninsula, south San Francisco Bay, East Bay, and in portions of the North Bay have been channelized or otherwise developed for flood control or agriculture.
- Most of these waterways are small, seasonal streams, and in the case of urbanized streams, many maintain perennial flows from urban runoff sources during late summer months.
- There are a handful of native streams and rivers in each county that account for the majority of freshwater flows to San Francisco Bay and provide the greatest opportunities for special-status plants and wildlife species.

The Bay Area is drained by many small to mid-sized rivers and creeks spread throughout the region (see Table 2.9-1). The Sacramento River Delta contributes the majority of the freshwater input to San Francisco Bay; however, this discussion concentrates on other tributaries in the region that provide important riverine and aquatic habitat. In the North Bay, the Petaluma River, Sonoma Creek, and Napa River account for much of the freshwater flows into San Pablo Bay. Relatively smaller, though biologically important contributions are made from Gallinas Creek, Novato Creek, Corte Madera Creek, and Miller Creek in Marin County. In general, there are few impediments or obstructions in these creeks and the watershed. Solano County watersheds are also relatively undeveloped, including the Putah Creek watershed. Lake Berryessa limits the availability of headwater habitats in Putah Creek to anadromous fish, but this creek still provides valuable aquatic resources.

Stream resources in the East Bay, South Bay, and San Francisco Peninsula have been degraded by urban development, particularly adjacent to and within stream courses. As a result of these changes, only a handful of major streams in these areas support native fisheries and special-status fisheries. These include Alameda Creek, which drains the largely undeveloped watershed of the Sunol Valley and Livermore-Amador Valley, Coyote Creek, Guadalupe River, and Los Gatos Creek in the South Bay, and San Francisquito Creek, Permanente Creek, and San Mateo Creek on the San Francisco Peninsula. In Gilroy and Morgan Hill, Llagas Creek transports flows southward to the Pajaro River. Major dams or other fish impediments that prevent fish from

reaching the upper watersheds are present in all of these streams, with the exception of San Francisquito Creek.

Fish species common to the lower, freshwater reaches of larger Bay Area creeks include Sacramento perch (*Archoplites interruptus*), splittail (*Pogonichthys macrolepidotus*), hitch (*Lavinia exilicauda*), tule perch (*Hysterocarpus traski*), Sacramento blackfish (*Orthodon microlepidotus*), Pacific lamprey (*Lampetra tridentata*), and Sacramento sucker (*Catostomus occidentalis*). These are often joined by the introduced largemouth bass and smallmouth bass (*Micropterus* spp.), goldfish (*Carassius auratus*), carp (*Cyprinus carpio*), bluegill, and green sunfish (*Lepomis* sp.), which can be found where there is year-round water, as well as mosquitofish (*Gambusia affinis*). Several catfish, including black bullhead (*Ictalurus melas*), brown bullhead (*Ictalurus nebulosus*), and channel catfish (*Ictalurus punctatus*), are widely distributed, especially in the warm lower reaches of Bay Area rivers and creeks. The Sacramento perch and Pacific lamprey are both California species of special concern and former federal species of concern. Habitat for common fish species occurs primarily in those streams listed in Table 2.9-1, though other streams in the Bay Area can and do support these species.

Rare Animals

Special-status fish are less common in rivers and streams of the Bay Area. These include the federally listed tidewater goby (*Eucyclogobius newberryi*), coho salmon (*Oncorhynchus kisutch*)–central California ESU, steelhead (*Oncorhynchus mykiss*)–central California ESU, Chinook salmon–California coast and California Central Valley spring run ESU (*Oncorhynchus tshawytscha*), and Sacramento splittail (*Pogonichthys lucius*). Several species of limited distribution and rarity occur exclusively in the lower reaches of drainages near and within the Delta, such as longfin smelt (*Spirinichus thaleichthys*) and the State- and federally-listed threatened Delta smelt (*Hypomesus transpacificus*). Llagas Creek crosses US 101 in the southern Santa Clara Valley subarea and, though dry seasonally, supports steelhead within the South/Central California ESU.

The federally listed endangered California freshwater shrimp (*Syncaris pacifica*) occurs in low gradient, structurally diverse perennial streams in the northern Bay Area.⁶ Of the 17 streams that support this species, those in the Bay Area include Sonoma Creek, the Napa River, and Huichica Creek, which drain to San Pablo Bay; and Laguna de Santa Rosa (Santa Rosa Creek) and its tributaries, which drain to the Russian River. The 1998 Recovery Plan for this species seeks the long-term protection of aquatic and riparian habitat as criteria for species delisting.

Suitable steelhead and coho salmon spawning habitat is found in streams and rivers where there is less development. Several small, cool-water drainages in Marin County support coho, which apparently do not successfully reproduce south of the Golden Gate.⁷ Steelhead require higher gradient, upper reaches of streams, with access to the ocean during emigration and spawning,

⁶ United States Fish and Wildlife Service, 1998.

⁷ Fed. Reg., 1999.

and cool year-round water temperatures for the juveniles' rearing habitat. Major rivers and creeks in the Bay Area with recent records of steelhead are noted with an asterisk (*) in Table 2.9-1, and those with recent records of Chinook are noted with a cross (†). Critical habitat was designated for the central coast population of steelhead and chinook salmon on September 2, 2005, and includes several streams in the Bay Area (Figure 2.9-5).

Bridges of various rivers and streams provide nesting opportunities for birds protected under the federal Migratory Bird Treaty Act, including the non-listed barn swallow (*Hirundo rustica*) and cliff swallow (*Petrochelidon pyrrhonota*), and the purple martin (*Progne subis*), a California species of special concern. These species build cup- and gourd-shaped nests, respectively, using mud as their primary construction material. Bat colonies may also roost under bridges in the Bay Area, including *Myotis* species, Mexican free-tailed bats (*Tadarida brasiliensis*), and Townsend's big-eared bats. Breeding and non-breeding bat roosts are protected by CDFG Code Section 4150.

Interior Wetlands

Natural Community Summary

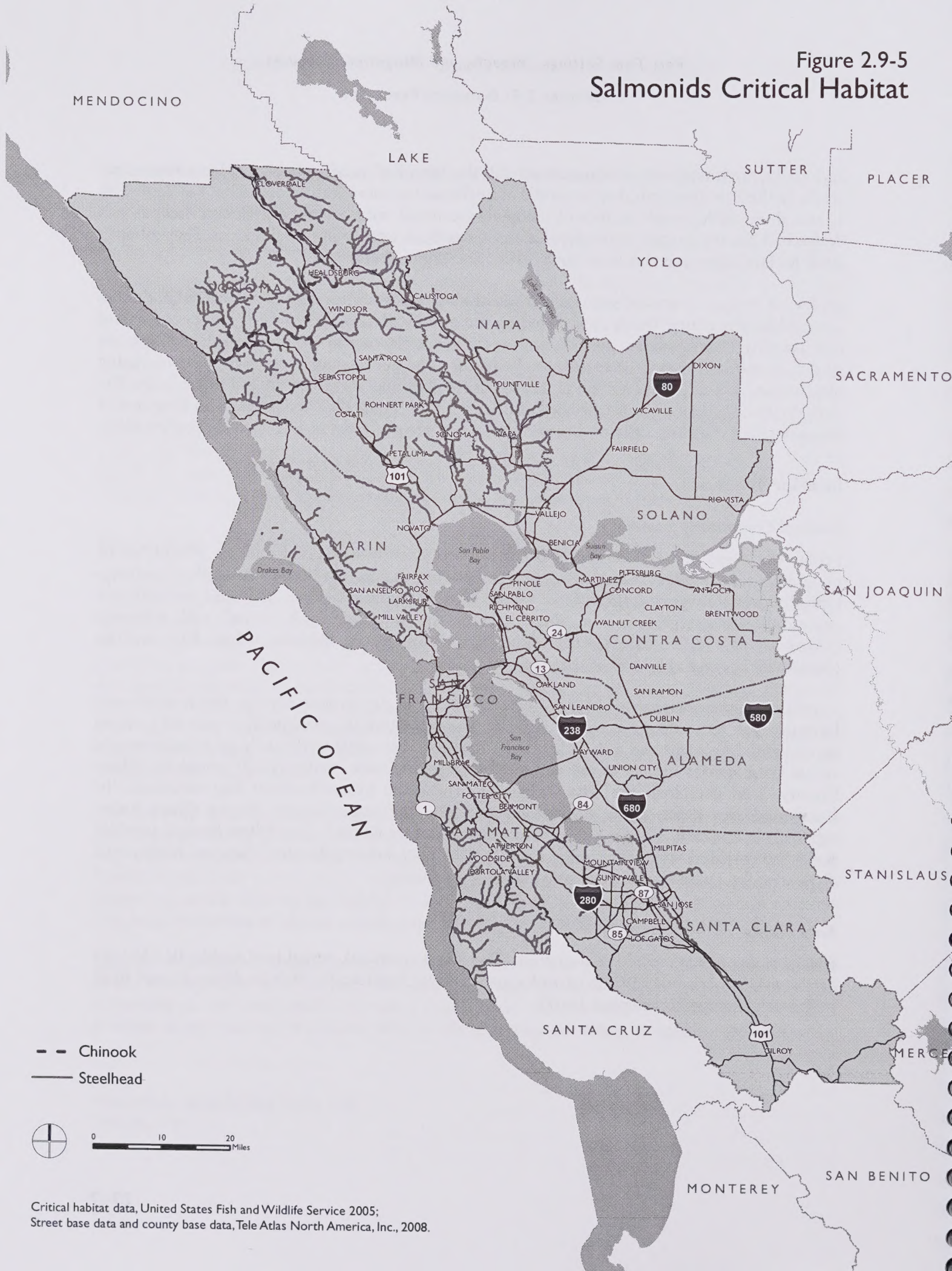
Freshwater seeps and wet meadows occur on permanently moist soil and are dominated by perennial grasses, sedges (*Carex* spp.), and rushes (*Juncus* spp.). In the Bay Area, these wetlands typically occur on grazed hillsides or at the base of grassland slopes. Some of the common vegetation series represented in these habitats are sedge, bulrush, cattail, and spikerush (*Eleocharis* sp.) series. Rare species found in freshwater seep habitats include blue skullcap (*Scutellaria laterifolia*) from the Delta region.

Vernal pools are seasonal freshwater pools that form in depressions over an impermeable soil layer (claypan or hardpan) or parent material. The vegetation in vernal pools is primarily annual species with low cover and a short life cycle. Ephemeral seasonal wetlands habitat that supports vernal pool species occurs in the eastern Livermore-Amador Valley (I-580 corridor), Solano County (I-80 corridor), the city of Fremont (near the Fremont-South Bay corridor), the Brentwood area (State Route 4 corridor), and near the Napa County Airport (Napa Valley subarea). In addition, alkali meadows and seeps in Contra Costa County (State Route 4 corridor and I-580 corridor) support a similar cast of vernal pool endemic species. These pools support a distinctive flora with a number of endemic and rare species.

Rare Plants

Special-status plants include Solano grass (*Tuctoria mucronata*), vernal pool smallscale (*Atriplex persistens*), San Joaquin saltbush (*Atriplex joaquiniana*), brittle scale (*Atriplex depressa*), and alkali milk vetch (*Astragalus tener* var. *tener*).

Figure 2.9-5
Salmonids Critical Habitat



Rare Animals

Special-status invertebrates found in the above-described habitats include vernal pool fairy shrimp (*Branchinecta lynchi*) and vernal pool tadpole (*Lepidurus packardi*). Freshwater emergent wetlands and adjacent grassland habitats in portions of the I-80 corridor in Solano County support populations of the federal-and State-threatened giant garter snake (*Thamnophis gigas*).

Coastal Marsh and Estuaries

Natural Community Summary

Freshwater and salt marshes are sensitive communities because of historic and continuing loss of wetland habitats from agricultural conversion, urbanization, and flood control development, and because they provide habitat for several special-status species. Coastal salt marshes around San Francisco Bay (including historically diked tidal marshes) are dominated by perennial pickleweed (*Salicornia virginica*), alkali heath (*Frankenia grandifolia*), fat hen (*Chenopodium album*), marsh gumplant (*Grindelia stricta* var. *angustifolia*), saltgrass (*Distichlis spicata*), and other salt-tolerant plants that are tolerant of regular inundation or soil saturation. Tidal salt marshes also may be bisected by a network of sloughs and small channels that facilitate tidal reach into the interior of the marsh. These channels are subject to more frequent and deeper flooding and therefore support different plant species, such as smooth cordgrass (*Spartina foliosa*) and alkali bulrush (*Scirpus maritimus*). These communities are sometimes categorized as northern coastal salt marsh, coastal brackish marsh, and coastal freshwater marsh, in order of decreasing tidal effects and salinity.

In more extensive slough systems, such as those in the North Bay and South Bay, the transition zones between sloughs and creeks are increasingly dominated by freshwater-adapted species such as California bulrush (*Scirpus californicus*) and cattails (*Typha* sp.). Extensive coastal marsh communities are present near the Bay Area's travel corridors in the Sonoma Creek and Napa River complexes (North Bay east-west corridor), at Suisun Marsh (I-680 corridor), and in patches along US 101 in Palo Alto and Mountain View (Peninsula corridor).

There are few terrestrial animals in the salt marsh and few resident bird species. Raptors that are typical of Bay Area salt marsh habitats include northern harrier (*Circus cyaneus*), red-tailed hawk (*Buteo jamaicensis*), and American kestrel (*Falco sparverius*). Migratory shorebirds that forage in the mudflats during low tide include black-necked stilt (*Himantopus mexicanus*), American avocet (*Recurvirostra americana*), long-billed curlew (*Numenius americanus*), marbled godwit (*Limosa fedoa*), and several sandpipers. During high tide, a few of the ducks that may be found in salt marsh environments include northern shoveler (*Anas clypeata*), American wigeon (*Anas americana*), northern pintail (*Anas acuta*), gadwall (*Anas strepera*), and canvasback (*Aythya valisineria*). Other common mammals in salt marsh habitats include California vole (*Microtus californicus*), house mouse (*Mus musculus*), and black-tailed jackrabbit (*Lepus californicus*).

Rare Plants

Rare plants include Delta tule pea (*Lathyrus jepsonii* var. *jepsonii*), soft bird's beak (*Cordylanthus mollis* ssp. *mollis*), Point Reyes bird's beak *Cordylanthus maritimus* ssp. *palustris*), Suisun thistle (*Cirsium hydrophilum* var. *hydrophilum*), and Suisun marsh aster (*Symphyotrichum lentum*).

Rare Animals

Rare and endangered wildlife species that occur among the pickleweed and cordgrass include California clapper rail (*Rallus longirostris obsoletus*), California black rail (*Laterallus jamaicensis coturniculus*), western snowy plover (*Charadrius alexandrinus nivosus*), Alameda song sparrow (*Melospiza melodia pusillula*), San Pablo song sparrow (*Melospiza melodia samuelis*), salt marsh common yellowthroat (*Geothlypis trichas sinuosa*), salt marsh harvest mouse (*Reithrodontomys raviventris*), San Pablo vole (*Microtus californicus sanpabloensis*), Suisun shrew (*Sorex ornatus sinuosus*), and salt marsh wandering shrew (*Sorex vagrans*) may occur in areas with high-quality emergent wetlands and adjacent upland environs.

San Francisco Bay Aquatic Resources

Natural Community Summary

The San Francisco Bay and Delta make up the Pacific Coast's largest estuary, encompassing roughly 1,600 square miles of waterways and draining over 40 percent of California's fresh water. The Sacramento and San Joaquin Rivers flow from Northern California's inland valleys into the Delta's winding system of islands, sloughs, canals, and channels, before emptying into San Francisco Bay and the Pacific Ocean. Six travel corridors bridge the open waters of San Francisco Bay, and many others are located in close proximity to the Bay.

The marine environment varies widely between the six travel corridors that cross the open waters of the San Francisco Bay. Most of the transbay corridors consist of open water habitat; that is, habitat below the low-tide line (also known as subtidal habitat).

Eelgrass (*Zostera marina*) may occur near the footings of bridges in the transbay corridors and is considered a sensitive habitat by CDFG. Eelgrass is an important habitat for many organisms and may influence benthic community structure by stabilizing sediments, providing forage and detritus food sources, and creating a refuge and nursery for small organisms. Eelgrass beds also provide an important attachment substrate for Pacific herring eggs⁸.

More than 100 species of fish are described from the San Francisco Bay system⁹. The majority of these are native species that live year-round in San Francisco Bay, though a few, such as striped bass (*Morone saxatilis*), have been introduced. Anadromous fish use San Francisco Bay

⁸ United States Fish and Wildlife Service, 1994.

⁹ United States Fish and Wildlife Service, 1983.

seasonally during their migrations to and from spawning grounds throughout the Bay Area and in the California's Central Valley.

The two marine mammals most commonly found in San Francisco Bay are the California sea lion (*Zalophus californianus*) and the harbor seal (*Phoca vitulina*). Both species forage in the open waters of the Bay and bask on exposed rocks, piers, or wharves throughout the Bay. The Marine Mammal Protection Act protects both species.

Rare Animals

The USFWS recognizes several threatened and endangered species that occur in San Francisco Bay. These include the Steller sea-lion (*Eumetopias jubatus*), the loggerhead sea turtle (*Caretta caretta*), leatherback turtle (*Dermochelys coriacea*), olive ridley sea turtle (*Lepidochelys olivacea*), and several fish species, including coho salmon–central California ESU, steelhead–central California coast ESU, tidewater goby, delta smelt, Pacific lamprey, and Sacramento splittail. The goby, smelt, lamprey and splittail are resident species; the other species, however, are expected to use open water habitats of the bay either seasonally or infrequently.

REGULATORY SETTING

The regulations and policies of various federal and state agencies (e.g., U.S. Army Corps of Engineers [Corps], U.S. Environmental Protection Agency [EPA], and USFWS) mandate protection of wetlands, special-status plant and wildlife species, and aquatic and terrestrial communities in the region. The Corps has primary federal responsibility for administering regulations that concern waters and wetlands, while the USFWS, National Marine Fisheries Service, and the CDFG have lead responsibility for determining potential project effects on federal- and state-listed species and other species of concern. A complete survey of agencies responsible for ensuring compliance with state and federal regulations is provided in Appendix D.

IMPACT ANALYSIS

SIGNIFICANCE CRITERIA

Implementation of the Transportation 2035 Plan would have a potentially significant adverse impact if the Plan projects would:

- Criterion 1:** Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as candidate, sensitive, or special-status in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or the U.S. Fish and Wildlife Service.
- Criterion 2:** Have a substantial adverse effect on riparian habitat, federally protected wetlands as defined by section 404 of the federal Clean Water Act (including but not limited to marsh, vernal pool, coastal, etc), or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California

Department of Fish and Game or U.S. Fish and Wildlife Service, through direct removal, filling, hydrological interruption, or other means.

Criterion 3: Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridor, or impede the use of native wildlife nursery sites.

Criterion 4: Conflict with adopted local conservation policies, such as a tree protection ordinance, or resource protection and conservation plans, such as a Habitat Conservation Plan (HCP), Natural Community Conservation Plan (NCCP), Coastal Zone Program, or other adopted local, regional, or state habitat conservation plan.

METHOD OF ANALYSIS

Though many of the individual Transportation 2035 investment projects have not been designed in any detail, a general representation of potential regional impacts on biological resources can be generated at this early stage based solely on the location of individual projects relative to the known and potential distribution of sensitive biological receptors. For this impact assessment, the locations of projects in the proposed Transportation 2035 Plan were compared with locations of sensitive species and important habitat areas. Potential impacts were determined by evaluating whether proposed transportation improvements would occur within the potential range of a special-status species of concern, whether the projects would directly encroach upon an area of ecological significance, or whether the projects could involve the filling of wetlands. However, this method is only reliable to a limited degree, as many special-status species have widespread distribution or are known to freely utilize a variety of habitat types.

Impacts would be more likely to occur where projects could have an effect upon ecologically sensitive or significant areas. Projects involving significant, ground-disturbing activity were reviewed with the closest scrutiny, including road widening, highway extensions, interchange projects, bridges and rail extensions. Resources used to identify these potential impacts included the California Natural Diversity Database, National Wetland Inventory Maps, city and county general plans, published environmental impact reports, or other CEQA/NEPA documents.

In many cases, the project alignments, locations, or other design details are not known because the projects are in the early stages of planning or development. As a result, this impact analysis relies largely on the potential for biological impacts based on proximity to sensitive resources, an analysis method that inherently tends to inflate the potential for adverse effects. Thus, while such impacts may be identified in this EIR, upon project implementation it is anticipated that actual impacts will be incrementally smaller. Laws and regulations protecting special-status species, areas of ecological significance, and wetland resources are effective incentives for project proponents to design alternatives that either avoid or substantially reduce impacts on these resources.

Projects that would not expand the right-of-way for transportation facilities were assumed to have minimal potential biological impacts. These projects include signal and traffic operational improvements, rail extensions along existing rights-of-way, and road widening in urban areas or

within existing rights-of-way. However, CEQA may require more detailed evaluations on a project-by-project basis to determine the exact resources found within proposed road or rail alignments. Since the specific details of many projects are not yet known, this assessment identifies general locations of potential adverse effects.

SUMMARY OF IMPACTS

The implementation of transportation improvements in the Transportation 2035 Plan would increase roadway footprints in the Bay Area and could incrementally impact adjacent wetlands, forested areas, grasslands, and other areas and the associated plant and wildlife species. Because the proposed transportation improvements are mainly concentrated along existing transportation corridors, the overall habitat loss and fragmentation is considered lower than if projects were entirely new construction.

Direct Impacts

Short Term Impacts

Short-term impacts resulting from completion of Transportation 2035 Plan improvements include the temporary loss and/or degradation of wetlands, sensitive natural communities, and special-status plant and wildlife species. Such impacts could result from construction disturbances, or from erosion or other indirect project effects. Temporary impacts may include the presence of temporary pile driving equipment in streams or other sensitive areas during bridge construction, short-term fill of wetlands, or the inadvertent release of soils or other materials into a jurisdictional wetland during construction activities.

Long Term Impacts

Direct long-term impacts on sensitive natural communities include effects on both common and special-status plant and wildlife species. This impact is due, in part, to the difficulty in constructing successful habitat replacement for natural areas such as wetlands, riparian forests, and native grasslands. Transportation improvements in the Transportation 2035 Plan that occur within or adjacent to coastal marsh and/or estuarine habitats have the potential to decrease habitat and result in significant long-term impacts on special-status plant and wildlife species. Other proposed transportation projects could also contribute incrementally to habitat loss for special-status plant or wildlife species.

Long-term increases in the volume of vehicular traffic and development of new roads in rural areas are expected to result in increased road casualties to common and special-status wildlife species. This effect would be most pronounced in rural areas, where facilities traverse marshland and grassland habitats. Such changes may also affect the volume of grease, oil, gasoline, and other contaminants entering Bay Area streams and San Francisco Bay and have deleterious effects on fisheries.

Indirect/Cumulative Impacts

Implementation of Transportation 2035 Plan projects could result in indirect biological resource impacts by accommodating new urban development that could have the potential to degrade wetlands and other sensitive natural communities and affect special-status plant and wildlife species. In addition, by improving regional mobility, transportation improvements in the Transportation 2035 Plan, when viewed cumulatively with other regional development projects, could serve planned development of rural environs – eastern Contra Costa County, southern Santa Clara County, the US 101 corridor in Marin and Sonoma counties, etc. Since these indirect impacts on biological resources are associated with forecast urban development in the Bay Area, they could also be considered a cumulative effect. In addition, other transportation improvements in the Transportation 2035 Plan not identified as having a direct impact on biological resources in the regional context may result in individually minor impacts locally. Collectively, these individually minor impacts on biological resources may become significant over time.

IMPACTS AND MITIGATION MEASURES

Impact

2.9-1 Transportation 2035 Plan projects could adversely affect wetlands and aquatic resources. (*Significant, mitigable*)

Impacts include the temporary disturbance to or permanent loss of wetlands or wetland function, incremental degradation of wetland habitats, or segmentation of habitats. Wetland resources in the immediate vicinity of proposed transportation improvements vary from relatively small, isolated roadside areas, wet meadows, and vernal pools to major streams and rivers, and vegetated shorelines. Any fill of significant wetland habitats associated with proposed transportation improvements would be considered a significant impact.

In addition to the direct loss of habitat, implementation of proposed transportation projects under the Plan could increase the potential for stormwater runoff to carry a variety of pollutants into wetlands, rivers, streams, and San Francisco Bay. Construction runoff often carries grease, oil, and heavy metals (due to ground disturbance) into natural drainages. Furthermore, particulate materials generated by construction could be carried by runoff into natural waterways and could increase sedimentation impacts. Based on the comprehensive project list, 120 projects were identified that have the potential to directly impact wetlands by fill, shading, or otherwise. The wetland impact assessment in Table 2.9-2 (located at the end of this chapter) was developed based on project proximity to blueline streams and other wetlands, where the proposed project either intersects, bridges, or could otherwise impact a jurisdictional wetland feature. Because the list focuses on major mapped wetlands, some smaller features that could be impacted may not be reflected. Conversely, because proximity of a project to a wetland is a poor indicator of actual impacts, the list may overstate the number of projects that will impact wetlands.

In accordance with guidelines of the U.S. Army Corps of Engineers (Corps), the U.S. Environmental Protection Agency (EPA), U.S. Fish and Wildlife Service (USFWS), Regional Water Quality Control Board (RWQCB), and California Department of Fish and Game (CDFG),

a goal of “no net loss” of wetland acreage and value is required, wherever possible, through avoidance of the resource. Where avoidance is not possible, mitigation for wetland impacts would be based on project-specific wetland mitigation plans, subject to approval by the Corps, and possibly by the USFWS, RWQCB, and CDFG. Supplemental mitigation measures are provided below.

Mitigation Measure

2.9(a) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce impacts on wetlands and aquatic resources that shall be considered by project sponsors and decision-makers may include, but are not limited to, those described below.

- In keeping with the “no net loss” policy, project designs shall be configured, whenever possible, to avoid sensitive wetlands and avoid disturbances to wetland and riparian corridors in order to preserve both the habitat and the overall ecological functions of these areas. Projects shall minimize ground disturbances and construction footprints near such areas to the extent practicable.
- Where avoidance of wetlands is not feasible, project sponsors will minimize fill and the use of in-water construction methods, and only do so with express permit approval from the appropriate resources agencies and in accordance with applicable existing regulations such as Coastal Zone regulations of wetland fill. Project sponsors shall arrange for off-site replacement of removed wetlands in accordance with the applicable existing regulation and subject to approval by the Corps, and possibly by the USFWS, RWQCB, and CDFG.

Avoidance, compensatory restoration, or creation of new wetland communities to offset the conversion of wetlands for proposed transportation improvements would achieve “no net loss” of wetland acreage and value. Implementation of this mitigation measure is expected to reduce potentially significant wetlands impacts to a less-than-significant level.

Impact

2.9-2 Transportation 2035 Plan projects could cause substantial disturbance of biologically unique or sensitive communities. (*Significant, mitigable*)

Proposed transportation projects located near or adjacent to protected plant communities could cause an incremental loss of these community types and would constitute a significant impact. Wetlands are a sensitive community, whose impacts may be regulated by the Corps, CDFG, and RWQCB, as discussed in Impact 2.9-1, above. Other State-protected vegetation or natural communities in the region are protected under CDFG, and include serpentine chaparral, northern maritime chaparral, coastal terrace prairie, serpentine bunchgrass, freshwater seeps, northern coastal salt marsh, coastal brackish marsh, coastal freshwater marsh, riparian forest,

California bay forest, and eelgrass beds¹⁰ (if special-status species are present in these sensitive communities, then impacts are also regulated by USFWS, as discussed in Impact 2.9-3, below). In general, the proposed projects are not located in areas that support sensitive communities that are regulated by CDFG; exceptions include several relatively widespread plant communities such as sycamore and willow-dominated riparian (wetland-associated) habitats, and vegetated stream channels. Because they are often associated with jurisdictional wetlands, impacts on sensitive plant communities are often covered during the permitting process. However, the permitting process would not address impacts on upland communities such as serpentine bunchgrass or coastal terrace prairie. Impacts on such communities would be addressed in coordination with CDFG.

The magnitude of Impact 2.9-2 within the project area is not known, but is likely similar to the level of impact anticipated in Impact 2.9-1 for wetlands, which identifies 122 sites where a potential impact may occur. Impacts on sensitive upland communities are not known, but would likely be minor because such communities are not common in developed portions of the Bay Area. However, there may be additional impacts to locally sensitive communities, not regulated by CDFG.

Mitigation Measure

2.9(b) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce impacts on biologically unique or sensitive communities that shall be considered by project sponsors and decision-makers may include, but are not limited to, those described below.

- In accordance with CDFG guidelines, project sponsors shall make an effort to minimize impacts on sensitive plant communities, especially riparian habitats, when designing and permitting projects. Where applicable, projects shall conform to the provisions of special area management or restoration plans such as the Suisun Marsh Protection Plan, which outlines specific measures to protect sensitive vegetation communities.

Implementation of this mitigation measure is expected to reduce potentially significant project impacts on biologically unique or sensitive communities to a less-than-significant level.

¹⁰ Holland, 1986.

Impact

2.9-3 Transportation 2035 Plan projects could have deleterious impacts on special-status plant and/or wildlife species identified as endangered, candidate, and/or special-status. (*Significant, unavoidable*)

For the purposes of this analysis, unless known to be absent, special-status species are presumed present in all areas that provide at least moderate quality habitat. Special-status species with the greatest potential to be impacted by Transportation 2035 Plan projects are listed in Table F-1 in Appendix F. Table 2.9-2 lists 88 projects that have the potential to impact special-status plant or wildlife species. This list of projects was generated based on project proximity to known sensitive habitats, and GIS-based maps showing USFWS proposed or designated critical habitat.¹¹

Potential effects on special-status species include the temporary removal of vegetation and habitat, direct mortality from equipment, loss or degradation of designated critical habitat, entrapment in open trenches, and general disturbance due to noise or vibration during pile-driving, earthmoving, and other construction activities. Additional impacts on special-status species could occur as a result of habitat fragmentation, increased human intrusion, erosion, introduction of invasive species, disruption of migratory corridors, sedimentation, filling and disturbance of aquatic habitats, and general reduction in biological diversity.

Mitigation Measure

2.9(c) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce impacts on special-status plant or animal species that shall be considered by project sponsors and decision-makers may include, but are not limited to, those described below.

- In support of CEQA, NEPA, CDFG and USFWS permitting processes for individual Transportation 2035 Plan transportation projects, biological and wetland surveys shall be conducted as part of the environmental review process to determine the presence and extent of sensitive habitats and/or species in the project vicinity. Surveys shall follow established methods and shall be undertaken at times when the subject species is most likely to be identified. In cases where impacts to State- or federal-listed plant or wildlife species are imminent, formal protocol-level surveys may be required on a species-by-species basis to determine the local distribution of these species. Consultation with the USFWS and/or CDFG shall be conducted early in the planning process at an informal level for

¹¹ United States Fish and Wildlife Service, 2005a; 2005b; 2006a; 2006b; and 2008; and the California Natural Diversity Database, 2008.

transportation projects that could adversely affect federal or State candidate, threatened, or endangered species to determine the need for further consultation or permitting actions.

- When drafting mitigations, adaptive management strategies shall be used, when feasible, to capitalize on the progressive understanding of ecological systems and management practices, apply lessons learned from current and future projects and research studies, accommodate for uncertainties or unknowns, and improve progress toward desired ecological outcomes.
- Project designs shall be reconfigured, whenever possible, to avoid sensitive wetland or biological resources and avoid disturbances to wetland and riparian corridors. Projects shall minimize ground disturbances and construction footprints near sensitive areas to the extent practicable.
- To the extent practicable, project activities in the vicinity of sensitive resources shall be completed during the period that best avoids disturbance to plant and wildlife species present (e.g., May 15 to October 15 near salmonid habitat and vernal pools).
- Individual projects shall minimize the use of in-water construction methods in areas that support sensitive aquatic species, especially when listed species could be present.
- In the event that equipment needs to operate in any watercourse with flowing or standing water, a qualified biological resource monitor shall be present at all times to alert construction crews to the possible presence of California red-legged frog, nesting birds, salmonids, or other aquatic species at risk during construction operations.
- If project activities involve pile driving or vibratory hammering in or near water, interim hydroacoustic threshold criteria for fish should be adopted as set forth by the Interagency Fisheries Hydroacoustic Working Group, as well as other avoidance methods to reduce the adverse effects of construction to sensitive fish, piscivorous birds, and marine mammal species.
- Construction periods shall not occur during the breeding season near riparian habitat, freshwater marshlands, and salt marsh habitats that support nesting bird species protected under the Endangered Species Act and Migratory Bird Treaty Act (e.g., yellow warbler, tricolored blackbird, California clapper rail, etc.).
- A qualified biologist shall locate and fence off sensitive resources before construction activities begin and, where required, shall inspect areas to ensure that barrier fencing, stakes, and setback buffers are maintained during construction.
- For work sites located adjacent to special-status plant or wildlife populations, a biological resource education program shall be provided for construction crews and contractors (primarily crew and construction foremen) before construction activities begin.
- Biological monitoring shall be particularly targeted for areas near identified habitat for federal- and state-listed species, and a “no take” approach shall be taken whenever feasible during construction near special-status plant and wildlife species.

- Efforts shall be made to minimize the negative effects of light and noise on listed and sensitive wildlife.

Implementation of this mitigation measure is expected to reduce the potentially significant impacts of projects on special status-species, but not necessarily to a less-than-significant level. Impacts on special-status wildlife species as a result of transportation infrastructure improvements are considered significant and unavoidable.

Impact

2.9-4 Transportation 2035 Plan projects could have deleterious impacts on proposed or designated critical habitats. (Significant, mitigable)

Approximately 43 transportation projects included in the Plan traverse areas that are proposed by the USFWS as critical habitat for California tiger salamander, California red-legged frog, Alameda whipsnake, bay checkerspot butterfly, or steelhead.

Impacts on critical habitat for the former four species consist of permanent or temporary modifications, or loss of areas that have high conservation value for these species. Impacts could also include the introduction of additional vehicular or recreational pressures where they do not currently exist. Most impacts to critical habitat would occur as roads that are currently on the boundary of critical habitat are widened (or otherwise expanded) into the critical habitat unit. Because Transportation 2035 Plan projects are on the fringe of these critical habitats, and because no new roads are proposed through critical habitat of these four terrestrial species, impacts are considered less than significant.

However, impacts on steelhead critical habitat may be significant, but mitigable. Potential impacts include several creek/stream crossings that will not impede fish passage or reduce the critical habitat acreage, but which may have indirect adverse impacts if projects result in increased sedimentation or other fill into these waters during construction activities.

Mitigation Measures

Mitigation measures 2.9(a) through 2.9(c), above, are expected to reduce impacts on steelhead critical habitat to less-than-significant. Specific projects that may be located within other critical habitat areas will be subject to established protocols for surveys and protective measures. As described in these mitigation measures, project designs shall be reconfigured to avoid or minimize adverse affects to the primary constituent elements of designated critical habitats to the extent practicable, and consultation with the USFWS shall be conducted early in the process at an informal level to determine the need for further mitigation, consultation, or permitting action. No further program-level mitigation measures are required.

Impact

2.9-5 Construction activities could adversely affect nonlisted nesting raptor species considered special-status by CDFG under CDFG Code 3503.5. (*Significant, mitigable*)

Nesting habitat for several nonlisted raptor species could occur near a number of proposed transportation projects. Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered a “taking” by the CDFG and would be considered a significant impact. Nesting habitat for northern harrier, white-tailed kite, Cooper’s hawk, and sharp-shinned hawk are present in grasslands and riparian habitats in the region. Additionally, red-shouldered hawk, red-tailed hawk, American kestrel, barn owl, great horned owl, and western screech owl may breed in riparian habitats. Nesting habitat for golden eagle may occur in open grasslands of the Diablo Range and Vaca Range in Napa, Solano, Contra Costa, and Alameda Counties.

Mitigation Measure

2.9(d) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce impacts on nonlisted nesting raptor species that shall be considered by project sponsors and decision-makers may include, but are not limited to, those described below.

- To avoid and minimize impacts to nesting raptors, preconstruction surveys shall be performed prior to initiating construction activities during the breeding season (February 1 through August 31). If it is determined that young have fledged and are self-sufficient, no further mitigation would be required.
- To avoid and minimize potential impacts to nesting raptors, a no-disturbance buffer zone shall be established around active nests during the breeding season.
- The size of individual buffers could be adjusted based on an evaluation of the site by a qualified raptor biologist in cooperation with the USFWS and CDFG.

Implementation of this mitigation measure would allow early recognition of nesting raptors in and near work areas, and is expected to reduce the potentially significant impact to nonlisted nesting raptor species to a level that is less-than-significant.

Impact

2.9-6 Construction activities could adversely affect non-listed nesting birds species, considered special-status by the USFWS under the federal Migratory Bird Treaty Act, and by CDFG under the CDFG Code 3503 and 3513. (Significant, mitigable)

Nesting habitat for non-listed birds protected under the federal Migratory Bird Treaty Act occurs in woodlands, riparian areas, and other areas, and may occur near some Transportation 2035 Plan projects. Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment, and would be considered a significant impact.

Mitigation Measures

2.9(e) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. At the time of project certification, project sponsors shall agree to comply with mitigation measures to avoid impacts to nesting bird species protected under the federal Migratory Bird Treaty Act, as follows:

- Concurrent with surveys described in Mitigation Measure 2.9(d), surveys shall be performed for migratory birds listed in the federal List of Migratory Birds (50 Code of Federal Regulations, Chapter 1, Part 10 Section 10.13). More than 500 native and migratory bird species are protected by this statute. If protected breeding birds are detected during surveys, a buffer zone, depending upon the species identified, shall be established around active nesting sites in coordination with CDFG and the USFWS.

This mitigation measure would be expected to reduce this potentially significant impact on non-listed nesting bird species protected under the federal Migratory Bird Treaty Act to a less-than-significant level if incorporated by project sponsors.

Impact

2.9-7 Implementation of the Transportation 2035 Plan could conflict with adopted resource protection or conservation plans. (Significant, but mitigable)

Several projects that are considered in this EIR are within the boundary of the East Contra Costa County Habitat Conservation Plan (ECCC HCP)¹², which took effect in January 2008 for Contra Costa County and the Cities of Brentwood, Clayton, Oakley, and Pittsburg; the California Coastal

¹² Jones & Stokes, 2006.

Zone, the Santa Rosa Plain Conservation Strategy, which has not yet been adopted; and the Santa Clara Valley Habitat Conservation Plan, which also has not yet been adopted. The impact discussion below pertains to the ECCC HCP and the California Coastal Zone Local Coastal Programs. If the Santa Rosa Plain Conservation Strategy or the Santa Clara Valley Habitat Conservation Plan are adopted, or additional plans are developed, Transportation 2035 Plan projects that are within those resource planning areas will be assessed on an individual basis to ensure consistency with adopted plans.

Eastern Contra Costa County Habitat Conservation Plan

Currently several MTC projects are covered by the ECCC HCP, including:

- (a) Transportation projects within the ECCC HCP Urban Development Area (UDA), including the construction and maintenance of roads, bridges, and highways. For example, Project 230247 (Lone Tree Way widening), Project 230289 (construct Main Street downtown bypass between Vintage Pkwy and 2nd St), and Project 230274 (widen Main Street from State Route 160 to Big Break Road).
- (b) Certain rural infrastructure projects in eastern Contra Costa County, listed in Table 6-6 of the ECCC HCP. For example, Project 230291 (Kirker Pass Road widening), and Project 230535 (Marsh Creek Rd. realignment at selected curves).

New roads or road improvements covered by this HCP will have direct and indirect impacts on HCP covered species. For example, new or expanded roads may create hazards or barriers to the movement of mobile species such as San Joaquin kit fox, California red-legged frog, California tiger salamander, and western pond turtle. Roads and other linear projects also create dispersal corridors for nonnative plants, introduce runoff of car waste (e.g., oil, grease, radiator fluid), and create substantial noise and physical disturbance. Vehicle traffic on roads generate debris such as tires, litter, or car parts that can be hazardous to wildlife.

Sponsors of covered projects will be required to comply with the ECCC HCP mitigation measures (and other measures of adopted HCP/NCCP).¹³ For the ECCC HCP, covered projects must submit a complete HCP/NCCP application package, submit required fees, fulfill the appropriate HCP survey requirements for wildlife, plants, wetland, and sensitive habitats, and comply with all applicable Conservation Measures, outlined in Chapter 6 of the HCP. Additional mitigation is provided below to help ensure that non-covered projects within the ECCC HCP area adhere to the same requirements and procedures as covered projects.

California Coastal Zone and Certified Local Coastal Programs

In the Bay Area, Sonoma County, Marin County, San Francisco County and City, San Mateo County, and the cities of Daly City, Pacifica, and Half Moon Bay, all have certified local coastal

¹³ Jones & Stokes, 2006.

programs (LCP). According to a basic map overlay, there are only 13 projects in the proposed Transportation 2035 Plan that occur in the coastal zone: seven in San Mateo County, three in Marin County, two in San Francisco County, and one in Sonoma County, totaling about \$628 million worth of investments. Most of the projects are basic widening and safety improvements. The largest investment is a committed project to construct the Devil's Slide bypass between Montara and Pacifica, a project which is already underway.

All of these projects must be compatible with the Coastal Act and applicable county or city certified local coastal programs, which include guidance for appropriate wetland fill mitigation (usually more demanding than wetland mitigation in other parts of the State), as well as restrictions on agricultural land conversion, open space and public access protection, habitat conservation, and coastal safety concerns. While it seems reasonable for this EIR to assume that the local governments submitting projects for inclusion in the RTP also vetted those projects for consistency with their existing LCP, nonetheless, a mitigation measure is provided below to support this planning consistency effort.

Mitigation Measures

As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce conflicts with adopted resource protection or conservation plans shall be considered by project sponsors and decision-makers may include, but are not limited to, those described below.

2.9(f) Project sponsors whose projects are located within the coastal zone shall carefully review the applicable local coastal program for potential conflicts, and involve the California Coastal Commission as early as possible in the project-level EIR process.

2.9(g) Relevant Conservation Measures, including species surveys and road design requirements, shall also apply, wherever feasible, to *non-covered*¹⁴ MTC transportation projects that fall within the ECCC HCP boundaries, as well as Plan projects outside the ECCC HCP boundaries, because issues related to wildlife road mortality, habitat fragmentation, wildlife corridor connectivity, and pre-and post-project wildlife monitoring are applicable to all transportation projects, not just those located within the HCP coverage area. For rural infrastructure projects, this includes but is not limited to the following Conservation Measure¹⁵:

¹⁴ Projects that are not already required to abide by the ECCC HCP are considered "non-covered" by the HCP.

¹⁵ Design requirements for covered rural infrastructure projects are outlined for each project in Table 6-6 of the East Contra Costa County HCP (Jones & Stokes, 2006). The measure described in detail here contains minor modifications from the ECCC HCP based on consultation with the USFWS.

Conservation Measure 1.14: Design Requirements for Covered Roads outside the UDA

Siting Requirements

- Planned roads will be located in the least environmentally sensitive location feasible and will avoid, to the greatest extent feasible, impacts on covered species and sensitive natural communities such as wetlands. Alignments will follow existing roads, easements, rights-of-way, and disturbed areas as appropriate to minimize additional habitat fragmentation. The footprint of disturbance will be minimized to the maximum extent practicable.
- Equipment storage, fueling, and staging areas will be sited on disturbed areas or on ruderal or non-sensitive nonnative grassland land cover types, when these sites are available, to minimize risk of direct discharge into riparian areas or other sensitive land cover types.
- Project surveys, including land cover mapping, will be conducted during the conceptual planning stage of each project (i.e., well in advance of project design) so that the results can inform the siting and design process. Project surveys should be conducted in as wide a study corridor as possible to enable project siting to minimize environmental impacts.
- All planning survey requirements of this Plan will be followed within the construction corridor (i.e., the limit of project construction plus equipment staging areas and access roads) and the entire road right-of-way. Expanding the survey area beyond the project footprint will help identify covered species and their habitats so that impacts on covered species that occur adjacent to the construction zone can be minimized.
- For certain road projects, identified in Table 6-6 of the HCP, data collection will be required on wildlife movement through the road study corridor for at least one year prior to project design. Wildlife movement will be studied at the site to determine which species move across it, when they move, and, most importantly, which landscape features are most often used. These data will be used to select the most appropriate design requirements for the species and conditions unique to the site (see below).
- Transportation project proponents will consult early with the HCP/NCCP Implementing Entity, CDFG, and USFWS on individual projects to ensure that conceptual designs (siting) and project designs (construction and staging areas) meet the terms of the HCP.

Design Requirements for Wildlife Movement and Impact Minimization

- Design requirements will be updated or changed by designs shown by the best available science to be more effective at facilitating safe wildlife movement across roads. The effectiveness of road crossings for wildlife is an active area of research, so frequent advances in design are expected throughout the permit term. Further, improvements will be design to be durable, simple, and require the least amount of routine maintenance possible to ensure long-term functionality.
- Wildlife crossing needs will be assessed for each road project as a whole (for those projects subject to this provision, not by road segment, and for each wildlife species likely to need to cross the facility. Data will be collected on wildlife movements at the proposed project site for at least 1 year. These data will inform the design of wildlife movement structures suitable for the site and the species that use the area.

- Road undercrossings will be constructed at frequent intervals to allow wildlife movement. A combination of large structures (bridges, large culverts, or large tunnels) spaced at greater intervals and small structures (small culverts or tunnels) spaced at frequent intervals will be used to accommodate a wide variety of wildlife species. However, placement of undercrossings in areas where wildlife are most likely to use them is more important than maintaining a certain frequency or spacing. Wildlife crossings that serve multiple species should be used whenever possible. Crossing facilities should be installed at known travel routes, natural pinch points,¹⁶ or other topographically appropriate locations to maximize the chance of use. Suitable areas may include stream crossings or natural drainages. Undercrossings should be placed at grade whenever possible to maximize their use by wildlife.
- Bridges, viaducts, or causeways¹⁷ will be used for certain projects to provide the most natural passageways for wildlife (i.e., to allow natural vegetation and physical features to occur in the undercrossing). If possible, bridges will span the bed and bank of streams and avoid or minimize bridge piers or footings within the stream, within bridge safety limits. If possible, the span of bridges that cross streams should also include some upland habitat beneath their spans to provide dry areas for wildlife species that do not use creeks or for use during storms. Native plantings, natural debris, or rocks should be installed under bridges to provide wildlife cover and encourage the use of crossings.
- Large wildlife crossings (for medium to large mammals) will be placed approximately once every mile along new or substantially expanded roads that cross wildlife movement routes. Small wildlife crossings will be placed approximately every 1,000 feet along new or substantially expanded roads. This is the same interval of undercrossings suitable for California tiger salamander installed along Vasco Road in the inventory area (65 undercrossings in 13 miles). Within these parameters, undercrossings should be placed where wildlife are most likely to use them, rather than evenly spaced. The required interval can be used as an average if it can be demonstrated that strict adherence to the requirement will not benefit wildlife movement.
- Tunnels or culverts must be the minimum length, height, and width necessary to provide safe passage under the road. Culvert designs will be based on the best available data at the time. Current thinking recommends that culverts designed for medium-size mammals such as San Joaquin kit fox, coyote, raccoon, be 5–8 feet in diameter (although culverts larger than 8 feet in diameter may be needed for longer crossings). Culverts designed for small mammals are recommended at 18–48 inches in diameter; smaller structures may be preferred by smaller wildlife species. Culverts should, when feasible, provide a natural substrate on which wildlife can travel (e.g., open bottom). It is also recommended that wildlife undercrossings using tunnels or culverts use grating on the inactive part of the roadbed (e.g., road shoulders) to allow filtration of ambient light and moisture but minimize noise intrusion. Artificial lighting

¹⁶ A pinch point is a constriction of habitat by a preexisting topographic or other feature such as a steep canyon, urban development, or narrowing band of woodland or scrub.

¹⁷ A viaduct is a long, multi-span bridge over upland habitat; a causeway is the same but often over wetland habitat.

inside tunnels or culverts is not recommended; these devices have not been shown to be effective and may deter nocturnal wildlife.

- Fencing will be used along the roadway to direct wildlife to undercrossings and minimize their access to the road (see Table 6-6 for applicability). Fencing designs will be customized for the wildlife expected to use the undercrossing and will be based on the best available data at the time. Fencing must be continuous along the road and must be attached to the undercrossing to facilitate its use. Fencing must also extend well beyond the target undercrossing to reduce the chance of wildlife moving around the fence. For example, four fencing designs have been installed along Vasco Road and monitored for their effectiveness in reducing mortality of California tiger salamanders. Fencing must be monitored regularly by the applicant and repairs made promptly to ensure effectiveness. Wildlife undercrossings must be at the same or similar elevation as the fencing (e.g., along elevated roadways) to increase chances of their use. Vegetation must be managed along small mammal and amphibian fencing to reduce the opportunity for these species to climb the fence. Fencing designed for small mammal or amphibian exclusion must be installed at least 8 inches deep into the soil to prevent small mammal burrows providing access under the fence. Where roads cross the wildlife exclusion fences, gates should be used whenever possible with material at the base of the gate to minimize the gap between the gate and the roadbed. If gates are not feasible, an in-roadway barrier (e.g., wildlife grates or similar devices) or device that channels species away must be installed to deter wildlife from moving around fences into the road.
- When compatible with vehicle safety, road medians should allow wildlife to cross under or over the median in the event they become trapped on the roadway.

Construction Requirements

The following measures are specifically required for rural road and transportation projects. Other conservation measures described in the ECCC HCP for covered activities also apply.

- No erodible materials will be deposited into watercourses. Brush, loose soils, or other debris material will not be stockpiled within stream channels or on adjacent banks.
- All no-take species will be avoided.
- Construction activities will comply with the Migratory Bird Treaty Act and will consider seasonal requirements for birds and migratory non-resident species, including covered species.
- Temporary stream diversions, if required, will use sand bags or other approved methods that minimize in-stream impacts and effects on wildlife.
- Silt fencing or other sediment trapping method will be installed downgradient from construction activities to minimize the transport of sediment off site.
- Barriers will be constructed to keep wildlife out of construction sites, as appropriate.
- Onsite monitoring will be conducted throughout the construction period to ensure that disturbance limits, BMPs, and Plan restrictions are being implemented properly.

- Active construction areas will be watered regularly to minimize the impact of dust on adjacent vegetation and wildlife habitats, if warranted.

The following construction measure will be applied differently to each rural road project, as specified in Table 6-6 of the ECCC HCP.

- Install sturdy lock-boxes for cameras at each large wildlife undercrossing to facilitate wildlife monitoring by the Implementing Entity. Boxes shall be designed for monitoring equipment to be used, include a removable door, and be prewired for electricity (solar, battery, or alternating current). This will provide for the least intrusive, most secure, most flexible, and most cost-effective way to monitor wildlife usage, while minimizing human impacts. Boxes will be mounted on adjustable pedestals to vary the height of the box to facilitate monitoring of target species of varying size.

Post-construction Requirements

- Roadside vegetation within the right-of-way and adjacent to HCP/NCCP Preserves or other open space areas will be controlled to prevent the spread of invasive exotic plants such as yellow star-thistle into nearby or adjacent preserves.
- Vegetation and debris must be managed in and near culverts and under and near bridges to ensure that entryways remain open and visible to wildlife and the passage through the culvert or under the bridge remains clear.
- Cut-and-fill slopes will be revegetated with native, non-invasive nonnative, or non-reproductive (i.e., sterile hybrids) plants suitable for the altered soil conditions.
- All structures constructed for wildlife movement (tunnels, culverts, underpasses, fences) must be monitored at regular intervals and repairs made promptly to ensure that the structure is in proper condition.

Implementation of this mitigation measure is expected to reduce potentially significant conflicts with ECCC HCP to a less-than-significant level.

Cumulative Impact

2.9-8 Transportation 2035 Plan projects, combined with forecast urban development, could contribute to the removal or fragmentation of habitat area. (*Significant Cumulative Impact, Contribution Cumulatively Considerable*)

Future Transportation 2035 Plan implementation, combined with effects associated with development under ABAG growth projections, would result in a cumulatively significant conversion and development of currently undeveloped and rural land. This cumulative scenario would have significant regionwide impacts on biological resources. Areas that would be affected include portions of the North Bay (Napa, Solano, and Sonoma Counties), and Contra Costa, Alameda, and Santa Clara counties. Potential cumulative effects include the hastened incremental loss and urbanization of habitat for the California red-legged frog and California tiger salamander, among other species.

In addition, other transportation improvements in the Transportation 2035 Plan, not identified as having a direct impact on biological resources in the regional context, may result in individually minor impacts locally. Collectively, these individually minor impacts on biological resources may become significant over time as species compete for reduced habitat opportunities.

Mitigation Measures

Despite feasible mitigation, the overall cumulative impact of fragmentation of habitat areas is considered to remain significant and unavoidable. The Plan contribution to this cumulative impact is much the same as the direct impacts described above, and the proposed mitigation measures would also be the same. Generally, these mitigation measures would be expected to reduce this potentially significant cumulative impact on most biological resources to a less-than-significant level if incorporated by project sponsors. However, similar to the proposed project direct impacts on sensitive species (Impact 2.9-3), the Plan's contribution to potential cumulative impacts on sensitive species remains cumulatively considerable despite feasible mitigation measures.

Table 2.9-2: Plan Projects that Could Potentially Impact Wetlands, Special-Status Plant or Wildlife Species, or Designated or Proposed Critical Habitat

Corridor	RTP ID	Project Description	Impacts By Plan Project			
			Wetland	Special Status	Critical Habitat	Conserv Area
Delta	21211	*Extend BART/East Contra Costa Rail (eBART) eastward from the Pittsburg/Bay Point BART station into eastern Contra Costa County	X	X		
Delta	21214	*Widen Wilbur Avenue over Burlington Northern Santa Fe Railroad from 2 lanes to 4 lanes		X		
Delta	22607	*Widen and extend major streets, and improve interchanges in east Contra Costa County	X	X	X	
Delta	98115	*Widen Ygnacio Valley/Kirker Pass Roads from 4 lanes to 6 lanes from Michigan Boulevard to Cowell Road		X	X	
Delta	98222	Construct freeway-to-freeway direct connectors between Route 4 Bypass and Route 160	X	X	X	
Delta	98999	*Widen Route 4 from Somersville Road to Route 160 and improve interchanges	X	X		
Delta	230203	*Construct Route 4 Bypass interchange at Sand Creek Road		X		
Delta	230205	*Widen Route 4 Bypass to 4 lanes from Sand Creek Road to Balfour Road		X		
Delta	230233	*Extend James Donlon Boulevard to Kirker Pass Road by constructing a new two-lane expressway		X		
Delta	230236	*Widen Pittsburg-Antioch Highway from 2 lanes to 4 lanes	X			

Part Two: Settings, Impacts, and Mitigation Measures

Chapter 2.9: Biological Resources

Table 2.9-2: Plan Projects that Could Potentially Impact Wetlands, Special-Status Plant or Wildlife Species, or Designated or Proposed Critical Habitat

Corridor	RTP ID	Project Description	Impacts By Plan Project			
			Wetland	Special Status	Critical Habitat	Conserv Area
Delta	230247	Widen Lone Tree Way to 6 lanes from O'Hara Avenue to Brentwood Boulevard				X
Delta	230250	*Widen Brentwood Boulevard from 2 lanes to 4 lanes between Marsh Creek and Delta Road	X			
Delta	230253	*Replace the old two-lane Fitzuren Road with a new, four-lane divided arterial		X		
Delta	230274	*Widen Main Street to 6 lanes from Route 160 to Big Break Road				X
Delta	230289	Construct Main Street Downtown Bypass road between Vintage Parkway and 2nd Street				X
Delta	230291	Add northbound truck climbing lane and a bicycle lane on Kirker Pass Road from Clearbrook Drive in Concord to just beyond the crest of Kirker Pass				X
Delta	230535	*Realign curves along Marsh Creek Road to improve safety and operations				X
Delta	230538	*Widen Bailey Road lanes and shoulders	X	X		
Delta	230690	I-680/Route 4 direct HOT connector in Contra Costa County – widen to add HOT lane	X	X		
Diablo	22352	Improve I-680/Norris Canyon Road	X	X	X	
Diablo	22354	Relocate the western half of the Marina Vista interchange off southbound I-680	X			
Diablo	22388	Construct Route 242 on-ramp and off -ramp at Clayton Road	X			
Diablo	22602	Construct I-680 auxiliary lanes in both directions from Sycamore Valley Road to Crow Canyon Road	X			
Diablo	22609	*Widen and extend major streets, and improve interchanges in central Contra Costa County	X	X	X	
Diablo	230216	Construct two-lane bridge connecting Waterworld Parkway with Meridian Park Boulevard	X			
Diablo	230240	Add additional left- or right-turn lanes at various intersections along Contra Costa Boulevard (between Monument Boulevard and 2nd Avenue)	X			
Diablo	230308	*Straighten curves to improve safety and operation of Alhambra Valley Road	X	X	X	
Diablo	230631	*Double the existing rail track between Oakley and Port Chicago	X	X	X	
Diablo	230685	I-680 in Contra Costa County from Alcosta Road to Benicia-Martinez Bridge – widen to add HOT lane and convert existing HOV lanes to HOT lanes	X			

Table 2.9-2: Plan Projects that Could Potentially Impact Wetlands, Special-Status Plant or Wildlife Species, or Designated or Proposed Critical Habitat

Corridor	RTP ID	Project Description	Impacts By Plan Project			
			Wetland	Special Status	Critical Habitat	Conserv Area
Diablo	230686	I-680 in Solano County from Benicia-Martinez Bridge to I-80 – widen to add HOT lane	X	X		
Diablo	230687	I-680/I-80 direct HOT connector in Solano County – widen to add HOT lane	X	X		
Eastshore North	22610	*Widen and extend major streets, and improve interchanges in west Contra Costa County	X	X	X	
Eastshore North	22613	*Widen and extend major streets, and improve interchanges in southwest Contra Costa County	X	X	X	
Eastshore North	22700	Construct parallel corridor north of I-80 from Red Top Road to Abernathy Road	X	X		
Eastshore North	94151	Construct 4-lane Jepson Parkway from Route 12 to Leisure Town Road	X			
Eastshore North	94541	*Reconstruct existing Benicia-Martinez Bridge for southbound traffic	X	X	X	
Eastshore North	230222	*Implement San Pablo Avenue SMART Corridors operations and Management	X	X		
Eastshore North	230225	*Improve and expand arterial streets in Central Hercules for transit facilities	X			
Eastshore North	230279	Extend John Muir Parkway in Hercules	X			
Eastshore North	230318	Extend North Richmond truck route along Soto Street from Market Avenue to Parr Boulevard	X	X		
Eastshore North	230322	*Rebuild and relocate eastbound Cordelia Truck Scales Facility	X	X	X	
Eastshore North	230401	*Construct bicycle- and pedestrian-friendly improvements along San Pablo Avenue from El Cerrito to Crockett	X	X	X	
Eastshore North	230468	Provide auxiliary lanes on I-80 in eastbound and westbound directions from I-680 to Air Base Parkway	X	X		
Eastshore North	230650	*Widen I-80 from Red Top Road to Air Base Parkway to add HOV lanes in both directions	X	X		
Eastshore North	230658	I-80 in Solano County from Route 37 to Carquinez Bridge – widen to add HOT lane	X			
Eastshore North	230659	I-80 in Solano County from Yolo County line to Route 37 – widen to add HOT lane from Yolo County line to Air Base Parkway and from Red Top Road to Route 37	X	X		
Eastshore-South	22670	*Construct HOV lane for southbound I-880 from Hegenberger Road to Marina Boulevard	X			
Eastshore-South	22768	*Retrofit and repair three Oakland-Alameda estuary bridges for seismic safety	X			

Part Two: Settings, Impacts, and Mitigation Measures

Chapter 2.9: Biological Resources

Table 2.9-2: Plan Projects that Could Potentially Impact Wetlands, Special-Status Plant or Wildlife Species, or Designated or Proposed Critical Habitat

Corridor	RTP ID	Project Description	Impacts By Plan Project			
			Wetland	Special Status	Critical Habitat	Conserv Area
Eastshore-South	230053	Reconstruct I-880 Industrial Parkway interchange (Phase I)	X	X		
Eastshore-South	230054	*Construct auxiliary lanes on I-880 at Industrial Parkway	X	X	X	
Eastshore-South	230088	*Extend the existing northbound I-880 HOV lane from north of Hacienda Avenue to Hegenberger Road	X	X		
Eastshore-South	230171	Improve Route 24/Caldecott Tunnel			X	
Fremont-South Bay	21132	Extend BART from Fremont to Warm Springs	X	X		
Fremont-South Bay	21482	*Extend Fremont Boulevard to connect with Dixon Landing Road in Milpitas	X	X	X	
Fremont-South Bay	21484	*Widen Kato Road from Warren Avenue to Milmont Drive to include bicycle lanes		X		
Fremont-South Bay	21921	Extend BART from Fremont to San Jose	X	X		
Fremont-South Bay	22779	*Reconstruct Route 262/I-880 interchange and widen I-880 (Phase 2)	X	X		
Fremont-South Bay	94030	*Reconstruct I-880/Route 262 interchange and widen I-880 from 8 lanes to 10 lanes (8 mixed-flow and 2 HOV lanes) from Route 262 (Mission Boulevard) to the Santa Clara County line (Phase I)	X	X	X	
Fremont-South Bay	94506	Construct an improved east-west connection between I-880 and Route 238 (Mission Boulevard) from North Fremont to Union City	X			
Golden Gate	21325	Improve local access to U.S. 101 from Tamalpais Drive to just north of Sir Francis Drake	X	X	X	
Golden Gate	21902	*Widen U.S. 101 for HOV lanes from Pepper Road to Rohnert Park Expressway (Central Phase A)	X	X		
Golden Gate	22204	Widen Fulton Road from 2 to 4 lanes from Guerneville Road to U.S. 101 and construct Route 12/Fulton Road interchange		X		
Golden Gate	22655	*Widen U.S. 101 for HOV lanes from Rohnert Park Expressway to Santa Rosa Avenue	X	X	X	
Golden Gate	94563	*Widen US 101 for HOV lanes (one in each direction) from Lucky Drive in Corte Madera to North San Pedro Road in San Rafael	X	X	X	
Golden Gate	98183	*Widen U.S. 101 for HOV lanes between Steele Lane and Windsor River Road (Phase A)	X			

Table 2.9-2: Plan Projects that Could Potentially Impact Wetlands, Special-Status Plant or Wildlife Species, or Designated or Proposed Critical Habitat

Corridor	RTP ID	Project Description	Impacts By Plan Project			
			Wetland	Special Status	Critical Habitat	Conserv Area
Golden Gate	230689	U.S. 101 in Sonoma County from Windsor River Road to Old Redwood Highway – widen to add HOT lane and convert HOV lanes to HOT lanes	X	X	X	
Golden Gate	230701	Widen U.S. 101 from the Route 37 to Marin/Sonoma County line (Marin County portion) and from Marin/Sonoma County line to Old Redwood Highway in Petaluma	X	X	X	
Marin County-wide	230095	Widen Route 1 at Pacific Way to provide a Muir Beach bus stop		X		
N. Bay East-West	21070	*Realign and widen Route 116 (Stage Gulch Road) along Champlin Creek	X			
Napa Valley	230508	Elevate Solano Avenue from Yountville to Dry Creek Road	X	X	X	
North Bay East-West	94152	*Widen Route 12 (Jamieson Canyon) from 2 lanes to 4 lanes from I-80 in Solano County to Route 29 in Napa County (Phase I)	X	X	X	
Peninsula	21604	Construct auxiliary lanes (one in each direction) on U.S. 101 from Sierra Point to San Francisco County line	X			
Peninsula	21608	*Construct auxiliary lanes (one in each direction) on U.S. 101 from Marsh Road to Embarcadero Road	X			
Peninsula	21610	Construct auxiliary lanes on U.S. 101 from San Bruno Avenue to Grand Avenue	X			
Peninsula	21612	Improve access to/from west side of Dumbarton Bridge on Route 84 connecting to U.S. 101	X			
Peninsula	21613	Improve Route 92 from San Mateo-Hayward Bridge to I-280	X			
Peninsula	21619	Expand Caltrain Express service (Phase 2)	X	X		
Peninsula	21893	Widen Route 92 from Half Moon Bay city limits and Pilarcitos Creek	X	X	X	
Peninsula	22227	Extend Geneva Avenue to the U.S. 101/Candlestick Point interchange	X			
Peninsula	22261	Replace San Pedro Creek Bridge over Route 1	X	X	X	
Peninsula	22282	Improve U.S. 101 operations near Route 92	X			
Peninsula	22751	Improve operations and safety of Route 1 in Half Moon Bay	X	X	X	
Peninsula	94643	*Widen Route 92 from Half Moon Bay City limits to Route 1	X	X	X	
Peninsula	94644	Construct westbound slow vehicle lane on Route 92 from Route 35 to I-280	X	X	X	

Part Two: Settings, Impacts, and Mitigation Measures

Chapter 2.9: Biological Resources

Table 2.9-2: Plan Projects that Could Potentially Impact Wetlands, Special-Status Plant or Wildlife Species, or Designated or Proposed Critical Habitat

Corridor	RTP ID	Project Description	Impacts By Plan Project			
			Wetland	Special Status	Critical Habitat	Conserv Area
Peninsula	94656	*Construct Devil's Slide Bypass between Montara and Pacifica	X			
Peninsula	98204	Add travel lanes on Route 1 (Calera Parkway) between Fassler Avenue to Westport Drive in Pacifica	X			
Peninsula	230417	*Modify U.S. 101/Holly Street interchange	X			
Peninsula	230428	*Extend Blomquist Street over Redwood Creek to East Bayshore and Bair Island Road	X			
Peninsula	230664	U.S. 101 in San Mateo County from Whipple Avenue to Millbrae – widen for new HOT lane	X	X		
Region-wide	22991	Widen I-680 southbound in Santa Clara and Alameda Counties from Route 237 to Route 84 including an HOV lane	X	X	X	
San Francisco	22008	Extend Caltrain to Transbay Terminal and replace Transbay Terminal (Phase 2a)		X		
San Francisco	230168	Improve the Great Highway between Lincoln Way and 48th Avenue		X		
San Francisco County-wide	94632	Extend Third Street Light Rail from Fourth and King Streets to Bayshore Caltrain Station	X			
Santa Clara County-wide	22944	Widen I-880 for HOV lanes in both directions from Route 237 in Milpitas to U.S. 101 in San Jose	X	X	X	
Santa Clara County-wide	230174	Construct a four lane bridge across Uvas Creek connecting the east and west sides of Tenth Street	X			
Santa Clara County-wide	230200	Improve local circulation on St. John Street and Autumn Street	X			
Santa Clara County-wide	230294	Conduct environmental and design to widen and create new alignment for Route 152 (from Route 156 to U.S. 101)	X	X	X	
Santa Clara County-wide	230449	Extend Charcot Avenue over I-880 as a new two-lane roadway	X	X	X	
Santa Clara County-wide	230456	Widen Zanker Road from 4 to 6 lanes		X		
Santa Clara County-wide	230458	Widen Berryessa Road from U.S. 101 to I-680	X			
Santa Clara County-wide	230459	Extend Chynoweth Avenue from Almaden Expressway to Winfield Road	X			
Santa Clara County-wide	230471	Widen intersections and improve sidewalks throughout the City of Sunnyvale	X	X	X	
Santa Clara County-wide	230531	Construct HOV and auxiliary lanes on U.S. 101 in Mountain View and Palo Alto, from Route 85 to Embarcadero Road	X			

Table 2.9-2: Plan Projects that Could Potentially Impact Wetlands, Special-Status Plant or Wildlife Species, or Designated or Proposed Critical Habitat

Corridor	RTP ID	Project Description	Impacts By Plan Project			
			Wetland	Special Status	Critical Habitat	Conserv Area
Santa Clara County-wide	230661	U.S. 101 in Santa Clara County from Cochrane Road to Route 25 – widen for new HOT lane	X	X	X	
Santa Clara County-wide	230679	I-280 in Santa Clara County from Leland Avenue to U.S. 101 – widen to add HOT lanes	X	X		
Santa Clara County-wide	230680	I-680 in Santa Clara County from Calaveras Road to U.S. 101 – widen to add HOT lanes	X			
Silicon Valley	21714	Widen U.S. 101 between Monterey Highway and Route 25 and construct an interchange at U.S. 101/Route 25/Santa Teresa Boulevard	X			
Silicon Valley	22134	* Construct a lane on southbound U.S. 101 using the existing median from south of Story Road to Yerba Buena Road				X
Silicon Valley	22162	Improve Route 237 westbound to Route 85 southbound connector ramp	X	X	X	
Silicon Valley	22175	Widen Almaden Expressway to 8 lanes between Coleman Road and Blossom Hill Road	X	X		
Silicon Valley	22179	Widen Central Expressway from 4 to 6 lanes between Lawrence Expressway and San Tomas Expressway	X			
Silicon Valley	22809	Realign DeWitt Avenue/Sunnyside Avenue intersection	X			
Silicon Valley	22839	*Convert the HOV lane on Central Expressway between San Tomas and De La Cruz to a general purpose lane	X	X		
Silicon Valley	22843	Widen Lawrence Expressway from 6 lanes to 8 lanes between Moorpark Avenue/Bollinger Road and south of Calvert.	X			
Silicon Valley	22854	Improve bicycle/pedestrian safety at I-280/Oregon-Page Mill interchange	X			
Silicon Valley	22873	Widen Loyola Bridge over Foothill Expressway	X			
Silicon Valley	22910	Add Traffic Operations System (TOS) infrastructure on Santa Teresa Boulevard between Day Road and Mesa Road	X			
Silicon Valley	22956	*Extend the Capitol Avenue light rail line 2.6 miles from the Alum Rock Transit Center to a rebuilt Eastridge Transit Center	X	X		
Silicon Valley	230210	*Rebuild box culvert under San Tomas Expressway	X			
Silicon Valley	230242	Add Capitol Expressway Traffic Operations System (TOS) between U.S. 101 and Almaden Expressway	X	X	X	
Silicon Valley	230257	Convert HOV direct freeway connectors between I-880 and Route 237 to HOT direct freeway connectors	X	X	X	

Part Two: Settings, Impacts, and Mitigation Measures

Chapter 2.9: Biological Resources

Table 2.9-2: Plan Projects that Could Potentially Impact Wetlands, Special-Status Plant or Wildlife Species, or Designated or Proposed Critical Habitat

Corridor	RTP ID	Project Description	Impacts By Plan Project			
			Wetland	Special Status	Critical Habitat	Conserv Area
Silicon Valley	230267	* Widen and add HOV lanes on Montague Expressway between Lick Mill and Trade Zone Boulevards and on Guadalupe River Bridge and Penitencia Creek Bridge	X	X	X	
Silicon Valley	230269	*Construct a new interchange at Trimble and Montague Expressway		X		
Silicon Valley	230273	Widen Montague Expressway to 8 lanes between Trade Zone and I-680 and to 6 lanes between I-680 and Park Victoria	X			
Silicon Valley	230298	Replace Calaveras Boulevard 4-lane bridge over the Union Pacific Railroad tracks	X			
Silicon Valley	230363	*Construct interchange at I-880 and Montague Expressway		X		
Sunol Gateway	21112	*Improve Crow Canyon Road	X	X		
Sunol Gateway	98139	Acquire right-of-way for the ACE Service between Stockton and Niles Junction, complete track improvements between San Joaquin County and Alameda County, and expand Alameda County station platforms	X	X	X	
Sunol Gateway	230681	I-680 northbound in Santa Clara County from Alameda County line to Calaveras Road – widen to add HOT lane	X			
Sunol Gateway	230682	I-680 northbound in Alameda County from Santa Clara County line to Route 84 – widen to add HOT lane	X	X		
Sunol Gateway	230683	I-680 in Contra Costa County from Route 84 to Alcosta Road – widen to add HOT lane	X			
Transbay	22002	*Extend I-880 northbound HOV lane from Maritime Street to the Bay Bridge toll plaza	X	X		
Transbay	230613	*Implement ferry service between Hercules and San Francisco	X	X	X	
Tri-Valley	21116	*Widen I-580 from Tassajara Road to Greenville Road for HOV and auxiliary lanes	X	X		
Tri-Valley	21456	* Construct auxiliary lanes on I-580 between Santa Rita Road/Tassajara Road and Airway Boulevard	X	X		
Tri-Valley	21473	* Construct a 4-lane arterial connecting Dublin Boulevard and North Canyons Parkway in Livermore	X	X		
Tri-Valley	22013	* Construct I-580 eastbound truck climbing lane at the Altamont Summit	X	X	X	
Tri-Valley	230156	*Extend West Jack London Boulevard from west of Isabel/Route 84 to El Charro Rd		X		

Table 2.9-2: Plan Projects that Could Potentially Impact Wetlands, Special-Status Plant or Wildlife Species, or Designated or Proposed Critical Habitat

Corridor	RTP ID	Project Description	Impacts By Plan Project			
			Wetland	Special Status	Critical Habitat	Conserv Area
Tri-Valley	230157	*Construct a two-lane gap closure on Las Positas Road from Arroyo Vista to west of Vasco Rd	X	X		
Tri-Valley	230665	I-580 westbound in Alameda County from San Joaquin County line to I-680 – widen to add HOT lane and convert existing HOV lane to HOT lane	X	X		
Tri-Valley	230684	I-680/I-580 direct HOT connector in Alameda County – widen to add HOT lane at connector and eastbound to Tassajara Road	X			

* Projects that are part of the Heavy Maintenance/Climate Protection Emphasis alternatives.

Source: Environmental Science Associates, 2008

2.10 Visual Resources

The San Francisco Bay Area contains some of the most recognizable natural and built views in the world. Important views of natural features include the Pacific coast, San Francisco Bay, Mount Tamalpais, Mount Diablo, and other peaks and inland valleys of the Coast Range. Enclosed views like those along roads winding through redwood groves, and broader views of the ocean and lowlands, such as along ridgelines, are in abundance in the Bay Area. Cityscape views offered by buildings and distinctive Bay Area bridges are also important built visual resources to the region. Transportation facilities have the potential to affect both what is seen and how it is seen.

This chapter describes the visual resources of the Bay Area and the types of impacts that projects in the proposed Transportation 2035 Plan could have on those resources. This analysis focuses specifically on views from the road and transit corridors and on views from public viewing areas and existing land uses along travel corridors.

ENVIRONMENTAL SETTING

PHYSICAL SETTING

The Bay Area stretches along the central northern Pacific coast of California, with several branches of the Coast Mountain Range dividing it into valleys, plains and water bodies. The largest of these valleys contains San Francisco Bay while at the eastern edge of the region is the great Central Valley, an extremely flat plain lying between the Coast Range and the Sierra Nevada Mountains. The hills of the Coast Range provide expansive views of the valleys and plains below, revealing a variety of development types, including urban areas along the Bay plains and inland valleys, agricultural lands and protected open space, and natural areas.

The landscapes of the San Francisco Bay Area are varied, unique, and recognized by many in the region and beyond. The basin formed by the coastal range, East Bay Hills, and the Bay itself are prominent physical features of the region. To the west, the Pacific Ocean and the Coastal Range dominate the visual setting, stretching from Mt. Tamalpais in the north to the Santa Cruz Mountains in the south. To the east, the Diablo Range, dramatically punctuated by Mount Diablo, provides a much different character. In the north, the vineyards of Napa and Sonoma counties are unique and draw visitors from around the world. Many built features in the Bay Area, the Golden Gate and Bay Bridge and the San Francisco skyline in particular, are also of international renown. Bay Area residents and tourists alike treasure the variety and quality of the visual experiences that are found along many transportation corridors in the region, from heavily traveled freeways, transit lines, and ferries, to narrow country roads through secluded forests and agricultural areas. Major transportation projects may affect the visual experiences of travelers and the distinctive visual environment of the region.

Hills and Valleys

The region contains several distinct mountain ranges and hills. Along the peninsula between the Pacific Ocean and San Francisco Bay lie the coastal hills of San Mateo, Santa Clara, and north of the golden gate, the hills of Marin County. The East Bay Hills rise steeply from the urbanized plain along the eastern edge of the Bay forming a several mile wide band that also defines the western edge of the Diablo and Livermore Valleys of Contra Costa and Alameda Counties. The rolling hills of the Diablo Range separate these valleys from the lowlands of the Central Valley. At the south end of the Bay Area in Santa Clara County, these hills converge. To the north, several ranges frame the Napa, Sonoma and Cotati valleys.

Between these ranges and hills are numerous valleys, both broad and narrow. San Francisco Bay, for example, is bordered along the east and west by a narrow, heavily urbanized plain. This plain widens in the south into the Santa Clara Valley, which until World War II was primarily agricultural. The East Bay and coastal hills, which are visible throughout these lowlands, orient the traveler and give a sense of scale to the surrounding urban areas. Likewise to the north, the hills forming the Sonoma, Napa, and Cotati Valleys enclose these agricultural areas with urban pockets.

Landmarks and Gateways

Certain features of the Bay Area stand out as symbols and points of orientation. These landmarks include the Golden Gate and Bay Bridges, San Francisco skyline, several large buildings in the East Bay Hills (the Campanile on the U.C. Berkeley campus, the Claremont Hotel and the Mormon Temple in Oakland, for example), and Mount Saint Helena at the northern end of the Napa Valley. These landmarks help travelers to locate themselves within the region, and in the case of the Golden Gate Bridge, symbolize the Bay Area for the rest of the world.

Likewise, several points along the roadways and rail lines of the Bay Area serve as visual gateways to the region or parts of it. The rest area on I-80 above Vallejo, the west end of the Caldecott Tunnel, and "hospital curve" along US 101 in San Francisco offer dramatic views of notable Bay Area landscapes.

Views from Travel Corridors

Many roadways and rail lines provide expansive, regional views of surrounding areas, often due to their wide rights-of-way, location along high points, elevation of the facilities, or a combination of these factors. Examples include I-280 along the Peninsula, Route 92 as it crosses the coastal range, I-80 near Rodeo, I-580 over the Altamont Pass and above Oakland, and the Route 24 corridor. The bridges crossing San Francisco Bay and the San Joaquin River offer similar experiences. Both the Bay and Golden Gate Bridge provide world-famous views of San Francisco while the Richmond-San Rafael Bridge includes sweeping views of the North Bay, including Mount Tamalpais and Angel Island. The Antioch Bridge allows views out over the Sacramento Delta.

Similarly, rail facilities (including BART) can provide travelers with broad views of the region or portions of it. The elevated BART lines through the East Bay, for example, give good views of the

East Bay Hills and the neighborhoods of Oakland, Berkeley, El Cerrito, etc. The Amtrak rail lines along San Pablo Bay and the San Joaquin River also provide broad views of the water with the hills beyond.

Roads and rail lines also provide more intimate views of forested hills or narrow valleys. Highway 35 (along the crest of the San Mateo Peninsula) and Route 84 (through the narrows of Niles Canyon) are examples of such views. Similarly, Route 1 and Sir Francis Drake Boulevard run through the forests and grasslands of Marin County to the beaches, parks, and open space areas along the coast. Route 29 and the Silverado Trail through the Napa Valley and Route 12 through the Sonoma Valley provide dramatic views of enclosing hills, adjoining vineyards, and the wineries.

Finally, while carrying only a small portion of the region's travelers, the use of the Bay ferries can be attributed, in part, to the spectacular viewing experiences afforded by this mode of transport.

Views of the Road

While roads and rail lines can provide access to view for travelers, these facilities can also detract from or block views for others, particularly those who live or work near such facilities. A new or expanded roadway along a hillside can be visible from a great distance, changing the impression of the hillside for the viewer, particularly if the hillside is undeveloped. Also, new roads and rail lines are often built above the level of existing development, which can overshadow nearby homes and businesses and limit views from them to the surrounding hills and valleys.

REGULATORY SETTING

State Regulations

California Scenic Highway Program

Recognizing the value of scenic areas and the value of views from roads in such areas, the State Legislature established the California Scenic Highway Program in 1963. This legislation sees scenic highways as "a vital part of the all encompassing effort...to protect and enhance California's beauty, amenity and quality of life." Under this program, a number of State highways have been designated as eligible for inclusion as scenic routes. Once the local jurisdictions through which the roadway passes have established a corridor protection program and the Departmental Transportation Advisory Committee recommends designation of the roadway, the State may officially designate roadways as scenic routes. Interstate highways, State highways, and county roads may be designated as scenic under the program. The Master Plan of State Highways Eligible for Official Scenic Highway Designation maps designated highway segments, as well as those that are eligible for designation. Changes to the map require an act of the legislature.

As noted, a corridor protection program must be adopted by the local governments with land use jurisdiction through which the roadway passes as the first step in moving a road from "eligible" to "designated" status. Each designated corridor is monitored by the State and designation may be revoked if a local government fails to enforce the provisions of the corridor protection program. At a minimum, each corridor protection program must include:

- Regulation of land use and density of development;
- Detailed land and site planning;
- Control of outdoor advertising devices;
- Control of earthmoving and landscaping; and
- Regulation of the design and appearance of structures and equipment.

The Master Plan of State Highways Eligible for Official Scenic Highway Designation requires that proposed realignments and route improvements be evaluated for their impact on the scenic qualities of the corridor.

The Bay Area includes several designated or eligible State Scenic Highways. Officially-designated State Scenic Highways are illustrated in Figure 2.10-1. All officially-designated and eligible State Scenic Highways in the Bay Area are listed in Table 2.10-1.

Table 2.10-1: California State Scenic Highway System Officially Designated (OD) and Eligible (E) Routes in the Bay Area

<i>Designation</i>	<i>Route</i>	<i>County</i>	<i>Location</i>
OD	1	San Mateo	Santa Cruz County Line to S. City Limit Half Moon Bay
OD	9	Santa Clara	Santa Cruz County line/Saratoga Gap to Blaney Plaza Saratoga
OD	9	Santa Clara	Blaney Plaza in Saratoga to Los Gatos city limit
OD	12	Sonoma	Danielli Ave E.of Santa Rosa to London Way N. Aqua Caliente
OD	24	Contra Costa	E. Portal Caldecott Tunnel to I-680 N. Walnut Creek
OD	35	San Mateo	Santa Cruz county line to Santa Clara county line
OD	35	San Mateo	Santa Clara county line to Half Moon Bay Road SR 92
OD	84	Alameda	SR 238 (Mission Blvd.) to I-680 near Sunol
OD	116	Sonoma	SR 1 to S. city limit of Sebastopol
OD	280	San Mateo	Santa Clara county Line to N. city limit San Bruno
OD	580	Alameda	San Joaquin county line to SR 205
OD	580	Alameda	San Leandro city limit to SR 24 in Oakland
OD	680	Alameda	Mission Blvd. in Fremont to Bernal Ave N. Pleasanton
OD	680	Alameda	Bernal Ave near Pleasanton to Contra Costa County Line
OD	680	Contra Costa	Alameda County Line to SR 24
E	1	Marin/Sonoma/Mendocino	SR 101 Near Marin City to SR 101 near Leggett
E	1	San Francisco	SR 35 in SF to SR 101 near Golden Gate Bridge in San Francisco
E	1	San Luis Obispo /San Mateo/San Francisco	SR 101 Near San Luis Obispo to SR 35 near Daly City

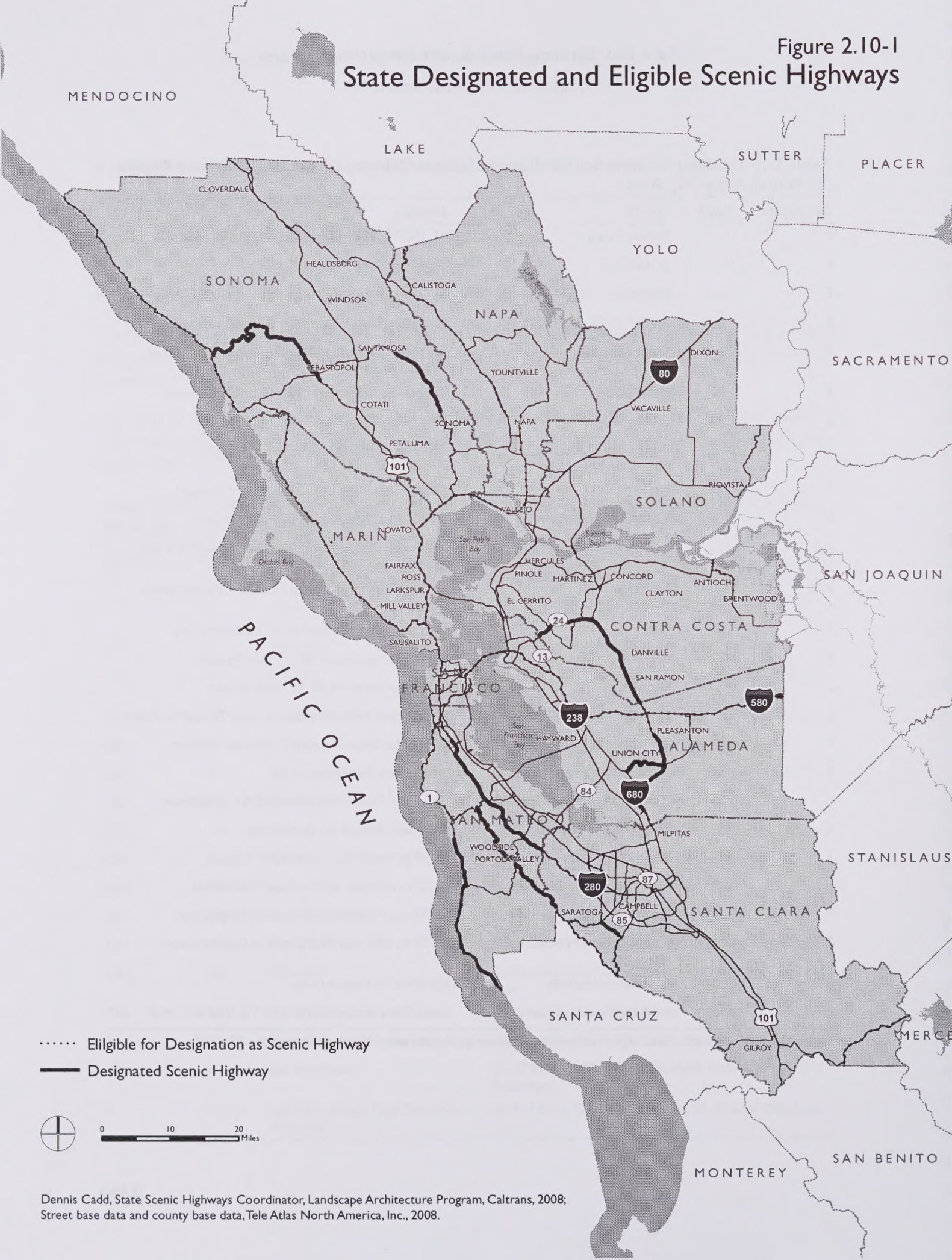
Table 2.10-1: California State Scenic Highway System Officially Designated (OD) and Eligible (E) Routes in the Bay Area

<i>Designation</i>	<i>Route</i>	<i>County</i>	<i>Location</i>
E	4	Contra Costa	SR 160 Near Antioch to SR 84 near Brentwood
E	9	Santa Clara	SR 35 to SR 17 near Los Gatos
E	12	Sonoma	SR 101 near Santa Rosa to SR 121 near Sonoma
E	17	Santa Cruz/Santa Clara	SR 1 near Santa Cruz to SR 9 near Los Gatos
E	24	Contra Costa	Alameda/Contra Costa county line to Rte. 680 in Walnut Creek
E	29	Napa/Lake	Trancas St. in Napa to SR 20 near Upper Lake
E	29	Solano/Napa	SR 37 near Vallejo to SR 221 near Napa
E	35	Santa Clara/SantaCruz/San Mateo/San Francisco	SR 17 to SR 92/I-280/SR 1 in San Francisco
E	37	Marin	SR 251 near Nicasio to SR 101 near Novato
E	37	Marin/Sonoma/Solano	SR 101 near Ignacio to SR 29 near Vallejo
E	80	San Francisco/Alameda	I-280 near First Street in San Francisco to SR 61 in Oakland
E	92	San Mateo	SR 1 N. Half Moon Bay to I-280 N. Crystal Springs Lake
E	101	Marin	Opposite San Francisco to SR 1 in Marin City
E	101	Marin	SR 37 near Ignacio to SR 37 near Novato
E	116	Sonoma	SR 1 near Jenner to SR 101 near Cotati
E	121	Napa	SR 221 near Napa St. Hosp. to near Trancas St. Napa
E	121	Sonoma	SR 37 near Sears Point to SR 12 near Sonoma
E	152	Santa Clara/Merced	SR 156 near San Felipe to I-5
E	156	Monterey/San Benito/Santa Clara	SR 1 near Castroville to SR 152 NE of Hollister
E	160	Contra Costa/Sacramento	SR 4 near Antioch to Sacramento
E	221	Napa	SR 29 at Suscol Rd to SR 121 in Napa
E	239	Alameda/Contra Costa	I-580 W.of Tracy to SR 4 near Brentwood
E	251	Marin	SR 37 near Nicasio to SR 1 near Point Reyes
E	280	Santa Clara/ San Mateo/ San Francisco	SR 17 to I-80 near First Street in San Francisco
E	580	San Joaquin/Alameda	I-5 SW of Vernalis to I-80
E	680	Alameda/Contra Costa	Santa Clara county line to SR 24 in Walnut Creek

Source: Dennis Cadd, State Scenic Highway Coordinator, Landscape Architecture Program, Caltrans, May 20, 2008

Figure 2.10-1

State Designated and Eligible Scenic Highways



Counties and municipalities also may have scenic route components within their individual general plans, but a separate scenic highways element is no longer required. Policies usually encourage the designation of these roadways as scenic corridors, either by local action or through the State program. Counties and municipalities may also establish regulatory programs or recommend corridor studies to determine the appropriate regulatory program to preserve scenic quality.

Local Regulations

City and County General Plans

In addition to establishing provisions for scenic roads, city and county general plans may include policies for protection of scenic resources, such as hillsides, natural areas, landmarks, and historic districts. Such policies may restrict new development in areas that maintain scenic vistas.

IMPACT ANALYSIS

SIGNIFICANCE CRITERIA

Implementation of the Transportation 2035 Plan would have a potentially significant adverse impact if Plan projects would:

- Criterion 1:** Block panoramic views or views of significant landscape features or landforms (mountains, oceans, rivers, or significant man-made structures) as seen from the transportation facility or from public viewing areas.
- Criterion 2:** Substantially damage scenic resources (such as trees, rock outcroppings, and historic buildings) that would alter the appearance of or from state- or county-designated or eligible scenic highways. Such projects would be judged against a higher standard for visual impacts due to this designation.
- Criterion 3:** Create significant contrasts with the scale, form, line, color and/or overall visual character of the existing landscape setting.
- Criterion 4:** Add a visual element of urban character to an existing rural or open space area or add a modern element to a historic area.
- Criterion 5:** Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area.

METHOD OF ANALYSIS

The visual impacts analyzed here are of two general types: changes in views for drivers; and changes in views for land uses along the roadways, transit corridors, and public viewing areas. The Transportation 2035 EIR uses a methodology similar to that in the Transportation 2030 EIR. Visual impacts were assessed by comparing the proposed Transportation 2035 Plan network to

existing conditions. First, projects that would not involve construction or would not significantly change the physical configuration of existing transportation facilities were eliminated, since such projects are unlikely to have effects on views. Examples of projects that involve construction but would not substantially modify existing facilities include seismic upgrades, safety improvements, signalization projects, freeway carpool lanes that do not require roadway widening, and roadway rehabilitation. This narrowed the list of investments to 141. Next, the remaining investment projects were reviewed to determine if they are located on designated or eligible State Scenic Highways. Physical alteration may result in visual contrast, loss of vegetation, variation in design or streetscape, etc. This narrowed the list further to 32 investments with the potential to cause visual impacts to designated or eligible State Scenic Highways.

SUMMARY OF IMPACTS

Many of the capacity-enhancing transportation improvements in the proposed Transportation 2035 Plan would have an effect on the visual character of the surrounding area or on views from a facility itself. Projects that could significantly alter views from and views of transportation facilities in the Bay Area include freeway and highway extensions and significant widening, grade changes, new freeway interchanges, and new rail lines (either light or heavy rail). Significant impacts would occur where the projects would block existing views or alter the appearance of a facility or the area that surrounds a facility.

Implementation of the transportation improvements in the proposed Transportation 2035 Plan could result in both short-term and long-term visual impacts. The construction of proposed projects could result in short-term visual impacts from the blockage of views by construction equipment and scaffolding, the removal of landscaping, and other construction activities that impair local views.

Projects in the proposed Transportation 2035 Plan that would have a long-term visual impact include freeway or highway widenings on or adjacent to designated or eligible scenic highway segments, some interchange overcrossing projects, and rail transit extensions and stations. While there are no restrictions on scenic highway projects, local agencies and Caltrans must work together to coordinate projects and ensure the protection of their scenic value to the greatest extent possible.¹ In some cases, local governments have their own land use and site planning regulations in place to protect scenic values along a designated corridor. Both the impact of a facility on the landscape as well as the visual appearance of a facility itself are considered.² On scenic highways, a pleasing appearance is as important a consideration as is safety, utility, and economy.

Some projects may require the installation of soundwalls to mitigate noise impacts on adjacent residential development or other sensitive land uses. Soundwalls have visual impacts for roadway users and adjacent communities.

¹ State law requires the undergrounding of all visible electric distribution and communication utilities within 1,000 feet of a Scenic Highway.

² Caltrans. *Guidelines for Official Designation of Scenic Highways*. November 1990, p. 14.

IMPACTS AND MITIGATION MEASURES

Impact

2.10-1 Transportation 2035 Plan projects could affect visual resources during their construction. (*Significant, mitigable*)

The construction of projects in the proposed Transportation 2035 Plan could result in short-term visual impacts from the blockage of views by construction equipment and scaffolding, the removal of landscaping, temporary route changes, temporary signage, temporary lighting, exposed excavation and slope faces, and construction staging areas. Many of the projects in the proposed Transportation 2035 Plan will not result in significant construction impacts, as they involve transit route improvements, road operations and maintenance, and pedestrian and bicycle improvements which all involve minimal construction, if any. However, major capital projects that require new construction have the potential to result in substantial visual impacts during construction, which could take several months to several years. There are approximately 141 investment projects in the Transportation 2035 Plan that involve some form of major new construction.

Mitigation Measure

2.10(a) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce significant visual impacts that shall be considered by project sponsors and decision-makers may include, but are not limited to, programs for reducing the visibility of construction staging areas, for fencing and screening these areas with low contrast materials consistent with the surrounding environment, and for revegetating graded slopes and exposed earth surfaces at the earliest opportunity.

Implementation of this mitigation measure is expected to reduce potentially significant short-term visual impacts of construction to a level that is less than significant.

Impact

2.10-2 Construction of certain Transportation 2035 Plan projects could adversely affect visual resources by adding or expanding transportation facilities in rural or open space areas, blocking public views, or changing the visual character and quality of designated or eligible State Scenic Highways. (*Significant, unavoidable*)

The majority of investment projects within the Transportation 2035 Plan would have no impact on visual resources. These projects include operations, maintenance, minor rehabilitation, signal and signage improvements, and local arterial projects, for example. However, Table 2.10-2 identifies 32 projects in the Transportation 2035 Plan that could result in potentially significant

visual impacts along or adjacent to a designated State Scenic Highway, or a highway eligible for such designation. Overall, the greatest impacts would occur in the Peninsula corridor where seven projects would have potentially significant effects on the visual character of land adjacent to designated scenic highways or highways eligible for designation.

Table 2.10-2: Transportation 2035 Projects with Potentially Significant Visual Impacts in Scenic Corridors

<i>Corridor</i>	<i>Project ID</i>	<i>Description and Investment Type*</i>	<i>Potential Impact</i>
Alameda County-wide	230099	Construct northbound I-680 to westbound I-580 connector (N)	Increased visual contrast with adjoining development.
Alameda County-wide	98208	Construct soundwalls in various locations (N)	New visual elements in corridors and modifications could block views.
Delta	230232	Construct new interchange at Route 4/Phillips Lane (N)	New visual element in corridor.
Diablo	22602	Construct I-680 auxiliary lanes in both directions from Sycamore Valley Road to Crow Canyon Road (N)	Increased visual contrast with adjoining lands and open space.
Eastshore-North	22355	Modify I-80/Central Avenue interchange (N)	Modifications could block views of the Bay.
Eastshore-North	94151	Construct 4-lane Jepson Parkway from Route 12 to Leisure Town Road (N)	New visual element in corridor.
Eastshore-North	230326	Improve I-80/I-680/Route 12 Interchange (Phase I) (N)	Increased visual contrast with adjoining lands and open space.
Eastshore-North	230322	Rebuild and relocate eastbound Cordelia Truck Scales Facility (C)	New visual element in corridor.
Eastshore-North	230094	Construct soundwalls in Central Alameda County (C)	New visual elements in corridors, modifications could block views, increased visual contrast with adjoining lands and open space.
Golden Gate	21030	Improve U.S. 101/I-580 interchange (project approval and environmental design phases only) (N)	New visual element in corridor.
Golden Gate	22204	Widen Fulton Road from 2 to 4 lanes from Guerneville Road to U.S. 101 and construct Route 12/Fulton Road interchange (N)	Increased visual contrast with adjoining lands and open space.
Golden Gate	22193	Construct new bypass on Route 116 in Forestville (N)	Changed visual character of a rural area.
Napa Valley	22746	Widen Route 29/First Street overcrossing to 4 lanes (N)	Increased visual contrast with adjoining lands and open space.
Peninsula	98204	Add travel lane (one in each direction) on Route 1 (Calera Parkway) between Fassler Avenue and Westport Drive in Pacifica (N)	Increase visual contrast with adjoining lands and open space.
Peninsula	21613	Improve Route 92 from San Mateo-Hayward Bridge to I-280 (N)	Increased visual contrast with adjoining scenic lands.
Peninsula	21893	Widen Route 92 from Half Moon Bay city limits and Pilarcitos Creek (N)	Increased visual contrast with adjoining scenic lands.
Peninsula	22230	Construct auxiliary lanes (one in each direction) on I-280 from I-380 to Hickey Boulevard (N)	Increased visual contrast with adjoining lands and open space.

Table 2.10-2: Transportation 2035 Projects with Potentially Significant Visual Impacts in Scenic Corridors

<i>Corridor</i>	<i>Project ID</i>	<i>Description and Investment Type*</i>	<i>Potential Impact</i>
Peninsula	22239	Widen Manor Drive overcrossing over Route 1 (N)	Increased visual contrast with adjoining lands and open space.
Peninsula	94644	Construct westbound slow vehicle lane on Route 92 from Route 35 to I-280 (N)	Increased visual contrast with adjoining scenic lands.
Peninsula	22271	Widen Skyline Boulevard (Route 35) from 2 to 4 lanes between I-280 and Sneath Lane (N)	Increased visual contrast with adjoining lands and open space.
Santa Clara County-wide	230679	I-280 in Santa Clara County from Leland Avenue to U.S. 101 – widen to add HOT lanes (N)	Increased visual contrast with adjoining development.
Santa Clara County-wide	230680	I-680 in Santa Clara County from Calaveras Road to U.S. 101 – widen to add HOT lanes (N)	Increased visual contrast with adjoining lands and open space.
Santa Clara County-wide	230294	Conduct environmental and design studies to widen and create new alignment for Route 152 (from Route 156 to U.S. 101) (C)	Increased visual contrast with adjoining scenic lands.
Sunol Gateway	230682	I-680 northbound in Alameda County from Santa Clara County line to Route 84 – widen to add HOT lane	Increased visual contrast with adjoining lands and open space.
Sunol Gateway	230683	I-680 in Contra Costa County from Route 84 to Alcosta Road – widen to add HOT lane (N)	Increase visual contrast with adjoining development.
Transbay Bay Bridge	230502	Construct westbound I-580 to northbound U.S. 101 connector (C)	New visual element and could block views of the Bay.
Tri-Valley	21100	Construct auxiliary lanes on I-580 between Vasco Road and First Street and modify I-580/Vasco Road interchange (N)	Widening could increase visual contrast with adjoining development.
Tri-Valley	230665	I-680 in Contra Costa County from Alcosta Road to Benicia-Martinez Bridge – widen to add HOT lane and convert existing HOV lanes to HOT lanes (N)	Widening could increase visual contrast with adjoining lands and open space.
Tri-Valley	230666	I-580 eastbound in Alameda County from San Joaquin County line to Greenville Road – widen to add HOT lane (N)	Increased contrast with adjoining lands and open space.
Tri-Valley	230684	I-680/I-580 direct HOT connector in Alameda County – widen to add HOT lane at connector and eastbound to Tassajara Road (N)	Increased contrast with adjoining development.
Tri-Valley	230630	Tri-Valley Transit Access: construct westbound off-ramp to connect I-580 to Dublin/Pleasanton BART station (or equivalent) (C)	Increased visual contrast with adjoining development.

*C= Committed N= New Commitment

Source: Dyett & Bhatia, 2008

In addition to projects along scenic highways, there are highway widenings and new construction that would have the potential to affect rural or scenic vistas or change the character of existing views. For example, a highway widening could result in the removal of mature trees that serve to block views of the highway from adjacent land uses along the right-of-way. Without knowing the details of proposed projects, it is not possible to identify further the potential locations of possible visual impacts.

Mitigation Measure

2.10(b) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce significant visual impacts that shall be considered by project sponsors and decision-makers may include, but are not limited to, those described below.

Design projects to minimize contrasts in scale and massing between the project and surrounding natural forms and development.

- Site or design projects to minimize their intrusion into important viewsheds;
- Use see-through safety barrier designs (e.g. railings rather than walls) when possible;
- Develop interchanges and transit lines at the grade of the surrounding land to limit view blockage wherever possible;
- Contour the edges of major cut and fill slopes to provide a more natural looking finished profile and use natural shapes, textures, colors, and scale to minimize contrasts between the project and surrounding areas;
- Design landscaping along highway corridors to add significant natural elements and visual interest to soften the hard edged, linear travel experience that would otherwise occur;
- Complete design studies for projects in designated or eligible State Scenic Highway corridors. Consider the “complete” highway system and develop mitigation measures to minimize impacts on the quality of the views or visual experience that originally qualified the highway for Scenic designation.

Implementation of this mitigation measure is expected to reduce potentially significant visual resource impacts, but not to a less-than-significant level in all cases. The implementation of some transportation improvements in the proposed Transportation 2035 Plan may result in visual changes that could be considered adverse and significant by some viewers. Therefore, this impact remains significant and unavoidable.

Impact

2.10-3 The construction of soundwalls along freeways and arterials could significantly alter views. (*Significant, mitigable*)

Soundwalls are used to reduce noise levels in residential areas surrounding transportation infrastructure, usually high-speed or high-volume segments of roadways. The proposed soundwall program in Alameda County (investment project IDs 98208, 230094), along with other soundwalls that may be built to mitigate noise impacts of freeways and highway expansion projects, would affect the visual character of the streetscapes, highway and freeway corridors

where these soundwalls are constructed. Soundwalls reduce visual interest and sense of place, while also limiting views and sunlight from adjoining areas.

However, there are only a few soundwall projects in the Transportation 2035 Plan, and architectural relief, landscaping, and visual screening, which are now customary requirements for new soundwall programs, would soften the contrasts. Nonetheless, views into and out of affected neighborhoods would likely be blocked. Because the full scope of these programs has not yet been established, the extent of blocked views is unknown. As a consequence, given the small number of proposed soundwall projects, this impact can be reduced or avoided with appropriate mitigation.

Mitigation Measure

2.10(c) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce significant visual impacts associated with soundwalls that shall be considered by project sponsors and decision-makers may include, but are not limited to, those described below.

- Develop new or expanded roadways below the grade of surrounding areas to minimize the need for tall soundwalls.
- Use transparent panels to preserve views where soundwalls would block views from residences.
- Use landscaped earth berm or a combination wall and berm to minimize the apparent soundwall height.
- Construct soundwalls of materials whose color and texture complements the surrounding landscape and development.
- Design soundwalls to increase visual interest, reduce apparent height, and be visually compatible with the surrounding area.
- Landscape the soundwalls with plants that screen the soundwall, preferably with either native vegetation or landscaping that complements the dominant landscaping of surrounding areas.

Implementation of this mitigation measure is expected to reduce potentially significant impacts on visual resources to a level that is less-than-significant.

Cumulative Impact

2.10-4 Concurrent implementation of the proposed Transportation 2035 Plan and regional and local land use plans would result in a cumulatively considerable change in the

visual character of many areas in the region. (*Significant Cumulative Impact, Contribution Cumulatively Considerable, Mitigable*)

ABAG's *Projections 2007* anticipates that approximately 90,000 acres will be converted from undeveloped to urbanized land over the course of the 25-year planning period. Much of the developable flat land in the Bay Area has already been converted to urban use, so development opportunities include redevelopment of existing urban land as well as some hillside sites and rural land. However, urban limit lines have been established by many Bay Area communities to protect remaining open space, which will limit unanticipated consequences of development and resulting visual impacts. Likewise, many Bay Area communities have established general plan policies and ordinances to protect view sheds, and have incorporated this consideration in their project review processes.

Table 2.10-3 indicates that the proportion of total land in the region that will be developed for urban uses is only expected to increase from 18 to 20 percent, which is related to the land use pattern assumptions made for *Projections 2007*.

Table 2.10-3: Percent Developed Land By County, 2005-2035

County	2005	2010	2015	2020	2025	2030	2035
San Francisco	51%	52%	52%	52%	53%	53%	53%
San Mateo	30%	30%	30%	31%	31%	31%	31%
Santa Clara	20%	20%	21%	21%	21%	21%	21%
Alameda	29%	30%	31%	31%	32%	32%	33%
Contra Costa	24%	24%	25%	26%	27%	28%	28%
Solano	12%	13%	13%	14%	14%	14%	14%
Napa	5%	5%	5%	5%	5%	5%	5%
Sonoma	17%	18%	18%	18%	18%	18%	19%
Marin	12%	12%	12%	12%	13%	13%	13%
Region	18%	19%	19%	19%	20%	20%	20%

Source: Association of Bay Area Governments, *Projections 2007*; Metropolitan Transportation Commission, 2008; Dyett & Bhatia, 2008

In addition to the potential for changes in aesthetic environment on the edges of the urbanized area, there is perhaps an even stronger potential for cumulative change in the visual character of existing urban areas as transit centers and other infill development cut off existing views from homes and offices, and change the views from roadways that transition to accommodate more traffic and transit. There may be mixed feelings among community members about the relative positive and negative effects of these visual changes. In urban and ex-urban locations the visual pervasiveness of the transportation system is universal and in particular more pavement and more vehicles, combined with more buildings and transit infrastructure, may be visually undesirable to existing residents.

Local land use agencies are ultimately responsible for the approval of the forecast urban development that contributes to this cumulative impact. These agencies are accountable to their communities to apply development standards and guidelines to maintain compatibility with surrounding natural areas, including site coverage, building height and massing, building materials and color, landscaping, site grading, etc., in visually sensitive areas.

Based on this assessment, the overall cumulative impact of growth and development on visual resources may be significant and unavoidable despite the positive contributions of the proposed Project, and local land use regulatory efforts. To the extent that the proposed Transportation 2035 Plan projects, in aggregate, would create additional new urban environments and change the existing urban environments, these projects may contribute to the cumulative regional visual resources impact. In addition, improvements in the Transportation 2035 Plan not identified as having a direct visual impact in the regional context may result in individually minor visual impacts locally. Collectively, these individually minor visual impacts may become significant over time.

Mitigation Measures

Mitigation Measures 2.10(a) through 2.10(c) also apply to this cumulative impact. However, despite feasible mitigation, the overall cumulative impact is assumed to remain significant and unavoidable and the proposed Project's contribution to the impact is cumulatively considerable.

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2.11 Cultural Resources

Cultural resources in the Bay Area reflect centuries of human settlement in the region, and document the changing character of economic, social, and spiritual activities. There are several kinds of cultural resources in the Bay Area, including historic buildings and bridges, prehistoric archaeological sites, Native American sacred sites, native plants with important cultural significance to local tribes, as well as sensitive locations where resources are likely to be identified in the future, based on our existing knowledge of historic and prehistoric settlement patterns.

This chapter evaluates the potential cultural resource impacts resulting from the implementation of the proposed Transportation 2035 Plan. Cultural resources are the material remains identified with either the prehistoric inhabitants of the area (any time prior to the arrival of the Spanish in the latter half of the 18th century) or with the historic inhabitants. The historic period begins with the arrival of the Spanish and continues up to 45 years ago, a definition that is recognized under both CEQA and NEPA guidelines. While there are procedural differences between the State and federal guidelines, both establish the conditions under which a particular resource is determined to be significant and require mitigation as part of a proposed plan or project.

ENVIRONMENTAL SETTING

PHYSICAL SETTING

This section summarizes both historic and prehistoric resources and identifies the types of geographic areas that may contain cultural resources.

Prehistoric Resources

Prehistoric cultural resources are composed of Native American structures or sites of historical or archaeological interest. These may include districts, buildings, objects, landscape elements, sites, or features that reflect human occupations of the region, such as villages and burial grounds.

The moderate climate, combined with the abundant natural resources found throughout the nine-county region, has supported human habitation for several thousand years Before Present (BP). Some theories suggest that the prehistoric bay and river margins were inhabited as early as 10,000 years ago.¹ Rising sea levels, the formation of the San Francisco Bay, and the resulting filling of inland valleys have covered these early sites, which were most likely located along the then existing bay shore and waterways. Existing evidence indicates the presence of many village sites from at least 5,000 years BP in the region. The arrival of Native Americans into the Bay Area is associated with documented cultural resources from circa 5,500 BP.²

Six different groups of Native population, identified by their language, lived within the Bay Area, including Costanoan, Eastern Miwok, Patwin, Coast Miwok, Pomo and Wappo. These Native populations periodically increased between 5,000 BP and the arrival of the Spanish in the late

¹ EIP Associates, 1993.

² U.S. Dept. of Interior, 1990.

18th century. Native villages and campsites were inhabited on a temporary basis and are found in several ecological niches due to the seasonal nature of their subsistence base.

By the end of the first millennium A.D., population densities had grown to the point where less favorable environmental settings were being used for habitation. Traditional tribal territorial boundaries thus usually overlap; this is particularly the case in the South Bay. Groups competed for the hunting grounds, seed and acorn gathering areas and other areas necessary to a hunting-and-gathering culture. Remains of these early peoples indicate that main villages, seldom more than 1,000 residents, were usually established along water courses and drainages. Remains of satellite villages have been found in areas used for procurement of food or other resources. By the late 1760s about 300,000 Native Americans lived in California.³

Historic Resources

Historic resources are standing structures of historic or aesthetic significance. Architectural sites dating from the Spanish Period (1529-1822) through the early years of the Depression (1929-1930) are generally considered for protection if they are determined to be historically or architecturally significant. These may include missions, historic ranch lands, and structures from the Gold Rush and the region's early industrial era. Post-Depression sites may also be considered for protection if they could gain historic significance in the future. Historic resources are often associated with archaeological deposits of the same age.

The arrival of the Spanish and the development of the mission system in the latter half of the 18th century permanently disrupted the indigenous societies flourishing in the area. Native American settlements were abandoned and replaced with agricultural land, housing, and military support for the missions. The San Francisco Mission (Mission San Francisco de Asisi or Mission Dolores) and the Presidio (Yerba Buena) were founded in 1776. Both the Mission Santa Clara and the Pueblo de San Jose de Guadalupe were founded in 1777 in Santa Clara County.

After the Mexican revolt against Spain in 1822 California lands came under Mexican rule and large tracts of land, including the former missions, were granted to individual owners. It was during the Mexican era that most of the historic ranch lands and associated living quarters and operational structures originate.

Mexico ceded control of California to the United States at the end of the Mexican-American War (1846-1884), and the discovery of gold in the late 1840s brought thousands of prospectors and settlers into California. The Bay Area became the gateway to the gold of the Sierra Nevada, with rapid growth occurring in several of the region's fledgling cities, focusing in San Francisco as a shipping and financial center. Today the structures and sites from this Gold Rush period are often considered to be of historic significance.

An era of increased agricultural production followed the Gold Rush, with much of the region's inland valley natural grasslands plowed for wheat, orchard, and vegetable cultivation. Construction of levees in the Sacramento/San Joaquin delta reclaimed wetland areas for field crops and orchards, and lumbering, begun during the gold rush to supply mining operations, continued to supply a growing population. The completion of the intercontinental railroad in San

³ Association of Bay Area Governments, 1991.

Francisco in 1888 assured the Bay Area's continued prominence as an economic and population center for the West in general and for California.

In the early 1900s the Bay Area's economic base continued to grow and diversify, with a maritime industry developing around the Bay and manufacturing, trade, and the lumber industry aiding in the growth and development of the region. Urban areas continued to grow in accordance with transportation corridors. The rail lines of the early 1900s supported new development along their routes, with residential and commercial centers at their stops. The arrival of the automobile and roadway construction allowed population and economic centers to develop in more dispersed patterns throughout the region. Cultural resources from this manufacturing era include sites and structures associated with industrial development (i.e. railroad and maritime industries) and with prominent citizens of the time.

Recorded Regional Resources

The interpretations and designations of archaeological resources in the Bay Area are documented at the Northwest Information Center (NIC) at Sonoma State University. This information reflects the presence of known archaeological sites; known geological, soil, biological, hydrological, and topographical features; and the experience of archaeologists familiar with the field occurrences of such resources in the Bay Area.

As shown in Table 2.11-1, approximately 8,390 pre-historic and historic cultural sites have been recorded in the Bay Area and are listed with the California Historical Resources Information System (CHRIS), maintained at the NIC. If one counts all historic and prehistoric recorded sites, buildings, and structures with and without trinomial numbers assigned, there are over 31,000 such sites, buildings, and structures in the Bay Area.

Currently, there are 730 cultural resources in the nine-county Bay Area listed on the National Register of Historic Places and the California Register, of which approximately 282 are designated California Historic Landmarks. Completed only once in 1976, the California Inventory of Historic Resources documents a total of about 818 historic buildings, sites, or objects and 2,340 archaeological sites. No comprehensive Bay Area historic or archaeological surveys have been conducted more recently. The greatest concentration of listed historic resources occurs in San Francisco, with 170 sites on the National and California registers. Alameda County has the second highest number of Register-listed historic resources, at 150.

Table 2.11-1: Recorded Archaeological and Historical Sites in the Bay Area

Source of Record	County								
	Alameda	Contra Costa	Marin	Napa	San Francisco	San Mateo	Santa Clara	Solano	Sonoma
Recorded Prehistoric and Historic Sites ^a	693	812	789	1,104	176	820	915	445	2,637
Total Recorded Resources (including buildings) ^b	10,893	2,917	2,666	1,485	4,575	2,208	2,191	807	3,855
Cultural Resources listed individually on the National Register of Historic Places and the California Register of Historic Places ^c	150 BSO 0 AS	37 BSO 0 AS	36 BSO 4 AS	79 BSO 0 AS	170 BSO 5 AS	51 BSO 1 AS	101 BSO 2 AS	28 BSO 0 AS	62 BSO 4 AS
California Historic Landmarks ^d	51	27	20	16	49	35	43	14	27
California Inventory of Historical Resources (1976) ^e	221 BSO 344 AS	108 BSO 352 AS	30 BSO 413 AS	31 BSO 328 AS	141 BSO 26 AS	75 BSO 152 AS	149 BSO 61 AS	30 BSO 264 AS	33 BSO 400 AS
Bridges Listed on the Caltrans Local Bridge Survey ^f	175	187	123	93	78	120	239	115	223

Abbreviations: BSO (Building, Site, or Object); AS (Archaeological Site).

^a Northwest Information Center Database, May 2008.

^b Northwest Information Center Database, May 2008; number of all recorded sites including prehistoric and historic archaeological sites with and without trinomials, as well as recorded historic-period buildings and structures.

^c State Office of Historic Preservation's Quarterly Historic Property Directory, March 2008. Not included here are resources that have been listed as *contributors* to an Archaeological or Historic District, or resources that have been determined to be *eligible* for listing on the National Register or the California Register of Historic Places.

^d State Office of Historic Preservation's Quarterly Historic Property Directory, March 2008. BSO and AS are reported together.

^e Listings on the California Inventory of Historic Resources. Please note this inventory was done one time in 1976.

^f Caltrans Local Bridge Survey, Update 2005, computer database, query only pre-1960 bridges. Please note, a previous "Category 3" used to compile prior RTP EIR listings no longer exists in this survey, with the result that this update may show lower totals compared to previous surveys reported in other EIRs.

Source: Northwest Information Center, Sonoma State University, 2008

Locations of Sensitivity

Dense concentrations of Native American archaeological sites occur along the historic margins of San Francisco and San Pablo Bays. In addition, archaeological sites have also been identified in the following environmental settings in all Bay Area counties: near sources of water, such as vernal pools and springs; along ridgetops and on midslope terraces; and at the base of hills and on alluvial flats.

Native American archaeological sites have also been identified in the inland valleys of all of Bay Area counties. Remains associated with a Native American archaeological site may include chert or obsidian flakes, projective points, mortars and pestles, and dark friable soil containing shell and bone dietary debris, heat-affected rock, or human burials.

Dense concentrations of historic resources are often found in large urban areas and smaller cities that experienced growth and development during the historic period. Historic resources are also found in rural settings where homesteads, ranches, or farms were once present. Historic remains may include stone or adobe foundations or walls, structures and remains with square nails, and refuse deposits often in old wells and privies.

REGULATORY SETTING

Federal Regulations

The National Historic Preservation Act

The National Historic Preservation Act (NHPA) is the most prominent federal law dealing with historic preservation. The NHPA established guidelines to “preserve important historic, cultural, and natural aspects of our national heritage, and to maintain, wherever possible, an environment that supports diversity and a variety of individual choice.” The NHPA includes regulations specifically for federal land-holding agencies, but also includes regulations (Section 106) which pertain to all projects that are funded, permitted, or approved by any federal agency and which have the potential to affect cultural resources. All projects that are subject to the National Environmental Policy Act (NEPA) are also subject to compliance with Section 106 of the NHPA. Furthermore, all projects that are carried out by Caltrans are also subject to Section 106. At the federal level, the Office of Historic Preservation (OHP) carries out reviews under Section 106 of the NHPA.

National Register of Historic Places

Additionally, the NHPA authorizes the Secretary of the Interior to establish a National Register of Historic Places (National Register), an inventory of districts, sites, buildings, structures, and objects significant on a national, State, or local level in American history, architecture, archeology, engineering, and culture. The National Register is maintained by the National Park Service, the Advisory Council on Historic Preservation, State Historic Preservation Office, and grants-in-aid programs.

State Regulations

Office of Historic Preservation

The mission of the Office of Historic Preservation (OHP) and the State Historical Resources Commission (SHRC) is to preserve and enhance California's irreplaceable historic heritage as a matter of public interest so that its vital legacy of cultural, educational, recreational, aesthetic, economic, social, and environmental benefits will be maintained and enriched for present and future generations.⁴ California Public Resources Code 5024 requires consultation with the State Historic Preservation Officer (SHPO) when a project may impact historical resources located on State-owned land.

California Register of Historic Resources

The SHPO also maintains the California Register of Historic Resources (California Register). Historic properties listed, or formally designated for eligibility to be listed, on the National Register are automatically listed on the California Register (PRC Section 5024.1). State Landmarks and Points of Interest are also automatically listed. The California Register can also include properties designated under local preservation ordinances or identified through local historic resource surveys.

For a historic resource to be eligible for listing on the California Register, it must be significant at the local, state, or national level under one or more of the following four criteria:

1. It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States;
2. It is associated with the lives of persons important to local, California, or national history;
3. It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values; or
4. It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation (California Public Resources Code).

California Environmental Quality Act

21083.2: Archaeological Resources

CEQA directs the lead agency on any project undertaken, assisted, or permitted by the State to include in its environmental impact report for the project a determination of the project's effect on unique archeological resources; defines unique archeological resource; enables a lead agency to require an applicant to make reasonable effort to preserve or mitigate impacts to any affected unique archeological resource; sets requirements for the applicant to provide payment to cover costs of mitigation; and restricts excavation as a mitigation measure.

⁴ Office of Historic Preservation webpage: http://ohp.parks.ca.gov/?page_id=1054

21084.1: Historic Resources

CEQA establishes that adverse effects on an historical resource qualifies as a significant effect on the environment; and defines historical resource.

CEQA Guidelines

Section 15064.5 of CEQA guidelines define three ways that a property can qualify as a significant historical resource for the purposes of CEQA review:

1. If the resource is listed in or determined eligible for listing in the California Register of Historical Resources (CRHR);
2. If the resource is included in a local register of historical resources, as defined in section 5020.1(k) of the Public Resources Code, or is identified as significant in a historical resource survey meeting the requirements of section 5024.1(g) of the Public Resources Code unless a preponderance of evidence demonstrates that it is not historically or culturally significant; or
3. If the lead agency determines the resource to be significant as supported by substantial evidence (California Code of Regulations, Title 14, Division 6, Chapter 3, section 15064.5).

In addition to determining the significance and eligibility of any identified historical resource under CEQA and the California Register, historic properties must be evaluated under the criteria for the National Register should federal funding or permitting become involved in any undertaking subject to this document.

CEQA Guidelines on Mitigation of Cultural Resources Impacts

CEQA Guidelines Section 15126.4 states that “public agencies should, whenever feasible, seek to avoid damaging effects on any historical resources of an archaeological nature.” The Guidelines further state that preservation-in-place is the preferred approach to mitigate archaeological resource impacts. However, according to Section 15126.4, if data recovery through excavation is “the only feasible mitigation,” then a “data recovery plan, which makes provision for adequately recovering the scientifically consequential information from and about the historical resources, shall be prepared and adopted prior to any excavation being undertaken.” Data recovery is *not* required for a resource of an archaeological nature if “the lead agency determines that testing or studies already completed have adequately recovered the scientifically consequential information from and about the archaeological or historical resource.” The section further states that its provisions apply to those archaeological resources that also qualify as historic resources.

Native American Heritage Act

The Native American Heritage Act (NAHA) of 1976 established the Native American Heritage Commission (NAHC) and protects Native American religious values on State property (see California Public Resources Code 5097.9).

Public Notice to California Native American Indian Tribes

Government Code, Section 65092 includes California Native American tribes that are on the contact list maintained by the Native American Heritage Commission in the definition of “person” to whom notice of public hearings shall be sent by local governments.

Tribal Consultation Guidelines

Passed in 2004, Senate Bill (SB) 18 (Burton, D-San Francisco) now Government Code Section 65351 and 65352 establishes a procedure to help tribes and jurisdictions define tribal cultural resources and sacred areas more clearly and incorporate protection of these places earlier into the General Plan and Specific Plan processes. The SB 18 process mirrors the federal 106 Review process used by archaeologists as part of the environmental review conducted under NEPA (36 CFR Part 800.16) While not a component of CEQA review per se, the Lead agency is required to request consultation with responsible and trustee agencies, such as NAHC and neighboring tribes, during the initial study and EIR process (PRC 21080.3, 21080.4).

Disposition of Human Remains

Health and Safety Code Section 7050.5 states that when an initial study identifies the existence, or the probable likelihood, of Native American human remains within the project, a lead agency shall work with the appropriate Native Americans as identified by the NAHC as provided in Public Resources Code 5097.98. The applicant may develop an agreement for treating or disposing of, with appropriate dignity, the human remains and any items associated with Native American burials. Furthermore, Section 7050.5 of the California Health and Safety Code requires that construction or excavation be stopped in the vicinity of discovered human remains until the county coroner can determine whether the remains are those of a Native American. If the remains are determined to be Native American, the coroner must contact the NAHC.

Native American Graves Protection and Repatriation Act

Health and Safety Code Section 8010-8011 establishes a state repatriation policy intent that is consistent with and facilitates implementation of the federal Native American Graves Protection and Repatriation Act. The Act strives to ensure that all California Indian human remains and cultural items are treated with dignity and respect. It encourages voluntary disclosure and return of remains and cultural items by publicly funded agencies and museums in California. It also states the intent for the state to provide mechanisms for aiding California Indian tribes, including non-federally recognized tribes, in filing repatriation claims and getting responses to those claims.

Local Regulations

Historic Preservation Ordinances

In addition to national and State historic preservation legislation, many Bay Area counties and cities have adopted optional historic preservation general plan elements⁵ or enacted local ordinances that recognize and preserve historic sites. San Francisco, Sonoma, Napa, and San Mateo counties all have county-wide historic preservation programs and at least 18 Bay Area cities participate in the Certified Local Government Program (CLG) through the OHP. The CLG program is a partnership among local governments, the OHP, and the National Park Service (NPS) which is responsible for administering the National Historic Preservation Program. Participating cities include: Alameda, Benicia, Berkeley, Campbell, Danville, Los Altos, Los Gatos, Napa, Oakland, Palo Alto, Redwood City, San Francisco, San Jose, Santa Clara, Saratoga, Sunnyvale, and Vallejo.

IMPACT ANALYSIS

SIGNIFICANCE CRITERIA

Implementation of the proposed Transportation 2035 Plan would have a potentially significant adverse impact on cultural resources in the Bay Area if Plan projects would:

- Criterion 1:** Cause a substantial adverse change in the significance of a historic resource, defined as physical demolition, destruction, relocation or alteration of the resource or its immediate surroundings such that the significance of the historic resource would be materially impaired (Guidelines Section 15064.5).
- Criterion 2:** Cause a substantial adverse change in the significance of a unique archaeological resource.
- Criterion 3:** Disturb any human remains, including those interred outside of formal cemeteries.
- Criterion 4:** Destroy, directly or indirectly, a unique paleontological resource or site or unique geologic feature.

METHOD OF ANALYSIS

The cultural resources analysis identifies the potential impacts of the transportation program on archaeological, historical, and other cultural resources within the Bay Area, and uses a methodology similar to that in the previous Transportation 2030 Plan EIR. This methodology recognizes that important cultural resources may be encountered during ground-disturbing construction work on Transportation 2035 Plan projects that involve physical construction. It also recognizes that projects associated with the operation and maintenance of the transportation system, such as signalization, equipment replacement, and pavement maintenance, would not directly affect cultural resources. Since the specific locations of some cultural resources are not mapped, and since the extent of ground disturbance associated with various Transportation 2035

⁵ For a complete list of California communities with optional historic preservation general plan elements, the State Office of Planning and Research maintains and updates an annual Book of Lists:

<http://www.opr.ca.gov/planning/publications/2008bol.pdf>

Plan projects is unknown at this time, it is not possible to assess specific cultural resource impacts based on the location of these projects. For the same reasons, the analysis does not distinguish between regulatory conditions for privately- and publicly-owned land. Accordingly, no project-specific reviews or field studies are undertaken for this program EIR. The analysis is based on a review of the type and location of projects listed in the Transportation 2035 Plan, and their potential to disturb both known and unknown cultural resources.

California Historical Resources Information System

The California Historical Resources Information System (CHRIS) is a statewide system for managing information on the full range of historical resources identified in California. CHRIS is a cooperative partnership between the citizens of California, historic preservation professionals, twelve Information Centers, and various agencies. This system bears the following responsibilities: integrate newly recorded sites and information on known resources into the California Historical Resources Inventory; furnish information on known resources and surveys to governments, institutions, and individuals who have a justifiable need to know; and supply a list of consultants who are qualified to do work within their area.

The initial step in addressing cultural resources involved contacting the appropriate Information Center to conduct a record search. The record search summarized numbers of previously recorded resources and studies within the study area. (Table 2.11-1)

Tribal Consultation

The NOP was distributed to a list of all of the tribal governments in the Bay Area. In a letter in response to the NOP, the Federated Indians of Graton Rancheria requested a government-to-government consultation regarding the EIR and RTP. This meeting was held on March 21, 2008, at their offices in Rohnert Park. More description of the scoping process is provided in *Chapter 1.1: Introduction and Overview*, and a record of the scoping comments received at this meeting can be found in Appendix B.

In addition, MTC, in partnership with Caltrans District 4 and ABAG, held a tribal consultation meeting on October 3, 2008 to discuss transportation projects in the Transportation 2035 Plan and provide an additional opportunity for one-on-one consultation between MTC and the tribal government. Following this meeting, the Federated Indians of Graton Rancheria requested a one-on-one follow-up consultation meeting with MTC, which was held on October 15, 2008, to discuss how MTC could include in this EIR a description of the consultation process between project sponsors and the tribes when evaluating and mitigating impacts on cultural resources as part of project-level EIRs.

SUMMARY OF IMPACTS

While project-specific studies will be necessary to determine the actual potential for significant cultural resource impacts resulting from the implementation of the transportation improvements in the Transportation 2035 Plan, some general impacts can be assumed based on the type and location of the improvements.

Implementation of the transportation improvements in the proposed Transportation 2035 Plan could result in both short-term and long-term impacts related to cultural resources due to disturbance of known and unknown resources, artifacts, burial grounds, etc. during project

construction. All the counties in the Bay Area have the potential to yield undiscovered resources and since most of the Bay Area has not been systematically surveyed for cultural resources, it may not be possible to determine with any confidence what the direct impacts would be in specific project areas.

In general, projects that include ground-disturbing activities, such as grading, road widening, and excavation, have the potential to impact archaeological and paleontological resources and human burials. These projects may also impact historic resources if buildings or landmark structures are disturbed. Projects that include the introduction of new visual elements, such as new highway segments, or involve visual alterations, have the potential to impact historic architectural resources by creating visual incompatibility in the surrounding environment. If these projects involve ground-disturbance, impacts on archaeological sites may also occur. Projects that are limited to new or altered services but do not include ground-disturbing activities and do not include significant visual changes are projects that are unlikely to cause cultural resource impacts.

IMPACTS AND MITIGATION MEASURES

Impact

2.11-1 Transportation 2035 Plan projects that involve ground-disturbing activities and/or the introduction or alteration of visual elements have the potential to disturb, destroy, or significantly affect archaeological, paleontological, and/or geological resources and/or human remains. (Significant, mitigable)

The construction of transportation improvements in the proposed Transportation 2035 Plan could result in archaeological and paleontological resource impacts if construction activities include the disturbance of the native terrain. Projects involving excavation, grading or soil removal in previously undisturbed areas have the greatest likelihood to encounter significant archaeological and paleontological resources and human remains. Likewise, the establishment of staging areas, temporary roads, and any other temporary facilities necessary for construction activities has the potential to impact these cultural resources.

Projects in locations of sensitivity, such as historic Bay margins, ridgetops, midslope terraces, hill bases, alluvial flats and inland valleys, are more likely to encounter cultural resources. Most transportation corridors follow valleys and drainage areas which often correspond with historic settlement patterns. Projects involving improvements within existing urban areas, within existing transportation corridors, or to existing infrastructure or operations are less likely to impact archaeological or paleontological resources since these projects are located in already-disturbed areas that may have been subject to previous cultural resource surveys.

There are already regulations in place to protect archaeological resources and human remains. As stated in the regulatory setting, when an Initial Study identifies the existence, or the probable likelihood, of Native American human remains within the project, a lead agency must work with the appropriate Native American tribes, as identified by the NAHC as provided in Public Resources Code 5097.98. The applicant may develop an agreement for treating or disposing of, with appropriate dignity, the human remains and any items associated with Native American burials. Furthermore, Section 7050.5 of the California Health and Safety Code requires that construction or excavation be stopped in the vicinity of discovered human remains until the county coroner can determine whether the remains are those of a Native American. If the remains are determined to be Native American, the coroner must contact the NAHC.

Furthermore, all projects undertaken by Caltrans must abide by extensive procedures and policies, outlined in the *Caltrans Environmental Handbook, Volume 2*, which dictate the nature and extent of cultural resource protections consistent with Federal law.

The degree and extent of impacts will depend upon project-specific analysis to determine the precise area of impact and the value—i.e., the eligibility for local, State, or national recognition—of any archaeological or paleontological resource identified within a proposed alignment or project area. However, given the magnitude and location of several transportation improvements in the proposed Transportation 2035 Plan, and given the number of projects involving construction activities, it is possible that significant impacts on archaeological or paleontological resources could occur.

Mitigation Measures

2.11(a) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce impacts on archaeological, paleontological, and/or geological resources and/or human remains that shall be considered by project sponsors and decision-makers may include, but are not limited to, those described below.

- Face-to-face consultation with Native American tribes and individuals with cultural affiliations where the project is proposed to determine the potential for, or existence of, cultural resources, including cemeteries and sacred places, prior to project design and implementation stages.
- Preparation of a research design and testing plan in advance of implementation of the construction project, in order to efficiently facilitate the avoidance of cultural sites throughout the development process.
- Written assessment by a qualified tribal representative of sites or corridors with no identified cultural resources but which still have a moderate to high potential for containing tribal cultural resources.
- Upon “late discovery” of prehistoric archaeological resources during construction, project sponsors shall consult with the Native American tribe as well as with the “Most-Likely-Descendant” as designated by the Native American Heritage Commission pursuant to PRC 5097.
- Preservation in place; this is the preferred manner of mitigating impacts to archeological sites because it maintains the relationship between artifacts and the archeological context, and it may also avoid conflict with religious or cultural values of groups associated with the site. This may be achieved through incorporation within parks, green-space, or other open space by re-designing project using open space or undeveloped lands. This may also be achieved by following procedures for capping the site underneath a paved area. When avoiding and preserving in place are infeasible, a data recovery plan may be prepared according to CEQA Section 15126.4. A data recovery plan consists of: the documentation and removal of the archeological deposit from a project site in a manner consistent with professional (and

regulatory) standards; the subsequent inventorying, cataloguing, analysis, identification, dating, and interpretation of the artifacts; and the production of a report of findings.

Implementation of this mitigation measure, and adherence to State and federal regulations that protect cultural resources, is expected to reduce potentially significant archaeological and paleontological resource impacts to levels that are less than significant.

Impact

2.11-2 Transportation 2035 Plan projects have the potential to disturb or destroy historical resources. (*Significant, mitigable*)

Projects located in areas with known historical sites, or located in communities with established historic preservation programs, or involving activities that would introduce new visual elements or disturb the existing terrain have the potential to result in significant historic resource impacts. These projects could potentially reduce the aesthetic and physical integrity of historic districts and buildings. A higher incidence of conflict with historical sites is expected to occur in urban areas settled or developed more than 40 years ago. Projects traversing rural lands could also have significant impacts related to sites that are singular examples of a historical setting or structures whose historic value and significance have not been previously evaluated and recognized.

The degree and extent of impact will depend upon project-specific analysis that includes a determination of the value—i.e., the eligibility for local, State, or national recognition—of any historic resource identified within a proposed alignment or project area. Given the magnitude and location of several transportation improvements in the proposed Transportation 2035 Plan, and given the number of projects involving construction activities, it is possible that significant historic resource impacts could occur.

Mitigation Measures

2.11(b) As project sponsors prepare the environmental review document for their individual project pursuant to CEQA/NEPA and prior to environmental certification, project sponsors shall consider adopting appropriate measures that would minimize or eliminate cumulatively considerable environmental impacts pursuant to CEQA/NEPA. MTC shall be provided with status reports of compliance with mitigation measures pursuant to MTC Resolution 1481, Revised. Mitigation measures to reduce impacts on historical that shall be considered by project sponsors and decision-makers may include, but are not limited to, those described below.

- Assessment by a qualified professional of structures greater than 40 years in age within the area of potential effect to determine their eligibility for recognition under State, federal, or local historic preservation criteria.
- The treatment of identified historic resources in accordance with either the Secretary of the Interior's *Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings* or *Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings*.

Implementation of this mitigation measure, and adherence to State and federal regulations that protect historic resources, is expected to reduce potentially significant historic resource impacts to levels that are less than significant.

Cumulative Impact

2.11-3 Transportation 2035 Plan projects, combined with projected future population growth and development, may result in a cumulative disturbance of cultural resources. (*Significant Cumulative Impact, Contribution Cumulatively Considerable, Mitigable*)

ABAG's *Projections 2007* anticipates that approximately 90,000 acres will be converted from undeveloped to urbanized land over the course of the 25-year planning period. Much of the developable flat land in the Bay Area has already been converted to urban use, so development opportunities include redevelopment of existing urban land as well as some hillside sites and rural land. Both rural land conversion and urban infill have the potential to disturb cultural resources, and the overall cumulative impact of regional population growth and development is likely to be significant and unavoidable. To the extent that Transportation 2035 Plan projects also develop rural land or create infill changes to existing historic neighborhoods, they also have the potential to cause disturbance of cultural resources and to contribute to regional cumulative effects.

Mitigation Measures

Nonetheless, mitigation measures have been identified to reduce transportation project-related impacts on all kinds of cultural resources. For Transportation 2035 Plan projects requiring mitigation, implementation of mitigation measures 2.11(a) and 2.11(b), along with conformity with existing federal, State, and local regulations, is expected to reduce the Plan's contribution to the cumulative impact such that it is not cumulatively considerable.

2.12 Growth-inducing Impacts

Growth-inducing impacts are ways in which the proposed Transportation 2035 Plan may foster economic or population growth directly or indirectly in the surrounding environment. Transportation projects have the potential to induce growth by making traveling within a region and between regions easier, cheaper, and/or more attractive.

This chapter analyzes the ways in which the proposed Transportation 2035 Plan could generate population and employment growth beyond levels currently anticipated in regional and local plans. It describes the projected population and employment growth for the Bay Area between now and 2035 and the location of the projected growth within the region. It also discusses various population characteristics (e.g., age, ethnicity, and income), and identifies trends in the balance of jobs and housing throughout the region. Two primary data are used in this section: ABAG *Projections 2007* Summary Tables (e.g., City, County, etc.), and MTC's Superdistrict and County Summaries of ABAG's *Projections 2007* 2000-2035 Data Summary (2007). The latter of these two data sets is used for the majority of the demographics description.

POPULATION AND EMPLOYMENT GROWTH TRENDS AND PROJECTIONS

The Bay Area's population increased by 13 percent (760,000) from 1990 to 2000, while jobs increased by 14 percent (430,000).¹ Between 2000 and 2005, the Bay Area population increased by another 5 percent, while jobs actually declined by 7-8 percent (due to the "dot-com bust"). Looking ahead to 2035, ABAG projects that the Bay Area's population will grow another 27 percent from the 2005 level (nearly 2 million more residents), and employment will increase by 52 percent (1.8 million additional jobs).

During the past 40 years, the distribution of people has become more dispersed in the Bay Area as new urban centers have formed and cities on the edge of the region have gained population. The population growth in the Bay Area is illustrated in Table 2.12-1. Santa Clara County is the most populous county in the Bay Area and is home to about 26 percent of the region's residents. The county's largest city, San Jose, is also the largest city in the Bay Area with a population of 943,000, or about 13 percent of the region's residents in 2005.² Currently, there are 15 cities in the Bay Area with more than 100,000 residents.³

Table 2.12-2 shows that similar to the population trends, jobs are also redistributing between areas, but in five of nine Bay Area counties, jobs also saw a decline from 2000 to 2005. According to estimates from the California Employment Development Department (CEDD), the job decline has continued through 2008 in Alameda, San Francisco, and Santa Clara.

¹ 1990 Census; California Employment Development Department, 2008.

² Association of Bay Area Governments, 2007.

³ Department of Finance, May 2008a.

Table 2.12-1: Existing and Projected Population Growth in the Bay Area (2000-2035)

County	2008	2000	2005	2035	Growth: 2000-2005	Growth: 2005-2035	% of Growth to 2005	% of Growth to 2035
Alameda	1,543,000	1,443,741	1,505,299	1,938,600	61,559	433,300	20%	22%
Contra Costa	1,051,674	948,816	1,023,400	1,300,600	74,584	277,200	24%	14%
Marin	257,406	247,289	252,600	283,100	5,311	30,500	2%	2%
Napa	136,704	124,279	133,700	155,700	9,421	22,000	3%	1%
San Francisco	824,525	776,733	795,800	956,800	19,067	161,000	6%	8%
San Mateo	739,469	707,163	721,900	861,600	14,737	139,700	5%	7%
Santa Clara	1,837,075	1,682,585	1,763,000	2,380,398	80,415	617,400	26%	32%
Solano	426,757	394,542	421,600	585,800	27,058	164,200	9%	8%
Sonoma	484,470	458,614	478,800	568,900	20,186	90,100	6%	5%
Region	7,301,080	6,783,762	7,096,099	9,031,498	312,338	1,935,400	100%	100%

Source: Department of Finance, 2008; MTC's Superdistrict and County Summaries of ABAG Projections 2007 2000-2035 Data Summary, 2007

Table 2.12-2: Existing and Projected Employment Growth in the Bay Area (2000-2035)

County	2008	2000	2005	2035	Growth: 2000-2005	Growth: 2005-2035	% of Growth to 2005 ¹	% of Growth to 2035
Alameda	715,900	750,180	730,274	1,099,554	-19,890	369,280	7%	21%
Contra Costa	498,700	371,310	379,043	591,638	7,720	212,620	-3%	12%
Marin	132,600	134,185	135,470	165,184	1,190	29,810	0%	2%
Napa	71,600	66,358	70,695	98,566	4,330	27,880	-1%	2%
San Francisco	419,400	642,499	553,079	832,874	-89,410	279,770	29%	16%
San Mateo	369,200	386,616	337,346	521,991	-49,240	184,650	16%	10%
Santa Clara	820,000	1,044,145	872,866	1,365,827	-171,270	492,950	56%	27%
Solano	198,800	136,735	150,528	227,872	13,780	77,350	-5%	4%
Sonoma	252,600	221,507	220,462	344,286	-1,030	123,830	0%	7%
Region	3,478,800	3,753,535	3,449,763	5,247,792	-303,820	1,798,140	100%	100%

¹ The Bay Area experienced net job loss between 2000 and 2005. Thus, the percent of total change in employment from 2000-2005 depicts the county contribution to regional job losses during the period, rather than growth.

Source: California Employment Development Department, Labor Market Info, Local Profiles, 2008; MTC's Superdistrict and County Summaries of ABAG Projections 2007 2000-2035 Data Summary, 2007

However, over the long-term, ABAG projects that seven of the nine Bay Area counties will see job growth of over 50 percent by 2035.⁴ The cities projected to gain the largest number of people and jobs over the next 25 years are shown in Tables 2.12-3 and 2.12-4.

Table 2.12-3: Top Ten Bay Area Cities Ranked by Projected Population Growth (2000-2035)

City	2000	2000-2035 Change
San Jose	894,943	461,657
San Francisco	776,733	180,067
Oakland	399,484	143,016
Brentwood	23,302	67,198
Fremont	203,413	55,087
Dublin	29,973	52,627
Fairfield	96,178	48,322
Santa Rosa	147,595	46,205
Santa Clara	102,361	43,739
Vacaville	88,625	43,675

Source: Association of Bay Area Governments, Projections 2007

Table 2.12-4: Top Ten Bay Area Cities Ranked by Projected Employment Growth (2000-2035)

City	2000	2000-2035 Change
San Francisco	642,650	190,360
San Jose	417,500	189,860
Oakland	199,470	86,130
Santa Rosa	87,060	63,100
Fremont	104,830	44,010
Concord	59,860	36,500
Dublin	16,540	33,270
Livermore	32,820	32,190
Fairfield	45,810	30,100
Hayward	76,320	28,350

Source: Association of Bay Area Governments, Projections 2007

⁴ Association of Bay Area Governments, 2007.

AGE

The median age of the population rose from 35.6 to 36.5 from 2000 to 2005.⁵ However, as illustrated in Table 2.12-5, which compares the 1990 age distribution to the 2000 and 2005 age distribution estimates, the region has remained fairly stable in terms of the percentage of the population in each of the three age categories. In a majority of the region's counties, the percentages of the population 19 years of age or younger and 65 years of age or older have increased slightly or remained the same, while the working-age population share has decreased slightly or remained the same.

As the baby boomers age, the proportion of the population 65 and older is projected to increase. ABAG projections suggest the population of people 65 and older will increase by about 1.4 million, or 22 percent, from 2000 to 2035, resulting in about a quarter of the total regional population in 2035 being 65 years of age or older. About 52 percent of the population over 65 will be over age 75, and much less likely to drive.⁶ This aging trend is likely to pose a greater demand for transportation alternatives to driving and specialized transportation services.

Table 2.12-5: Age Distribution in the Bay Area

Age Category	County (Percent in 1990/2000/2005)				
	Alameda	Contra Costa	Marin	Napa	San Francisco
Under 19	26/27/27	28/29/30	21/22/22	26/27/26	18/16/22
Age 20-64	63/63/66	61/60/60	67/65/63	58/58/58	67/70/65
Over 65	11/10/11	11/11/12	12/14/14	17/15/16	15/14/13
Age Category	County (Percent in 1990/2000/2005)				
	San Mateo	Santa Clara	Solano	Sonoma	Region
Under 19	24/25/25	27/27/30	32/31/30	27/27/26	26/26/27
Age 20-64	63/62/62	64/63/61	60/59/59	59/60/61	63/63/62
Over 65	12/12/13	9/10/10	8/9/12	13/13/13	11/11/11
Due to rounding not all columns may total 100 percent..					

Source: U.S. Census, 1990; Association of Bay Area Governments, 2007

A corollary trend is the small decrease in the percentage of population in the working age brackets—ages 20 to 64. As the baby boomers continue to age, this percentage will most likely decrease and it is unlikely that the next generation will replenish the workforce. Rather, the most likely source of workers to fill new jobs will come from outside the Bay Area.

⁵ Ibid.

⁶ Ibid.

ETHNICITY

Since 1990, the Bay Area has grown more diverse, notably through the increase in Asian and Hispanic residents. Census 2000 figures show that non-Hispanic whites had dwindled to about 50 percent of the population in 2000. By 2035, non-Hispanic whites will constitute only 36 percent of the population. By 2035, Hispanics will constitute around 31 percent, Asians or Pacific Islanders around 24 percent, African Americans about 5 percent, and American Indians less than one percent of the population.⁷ Of these groups, the proportion of Asians or Pacific Islanders living in the Bay Area is much higher than the proportion of Asians or Pacific Islanders in California as a whole, while the proportions of Hispanics in the Bay Area is somewhat lower.

INCOME AND CAR OWNERSHIP

Mean household income is expected to increase by 30 percent (2005 constant dollars) between 2005 and 2035.⁸ Although increases in wealth are not likely to be evenly distributed among age groups and ethnic groups, rising income usually indicates a higher potential for car ownership. As a result, while approximately 9 percent of Bay Area households currently do not own a vehicle—down from 10 percent in 2000⁹—this percentage may continue to decrease (i.e. fewer zero-vehicle households) as more and more households are able to afford vehicles. A possible exception, however, are households residing in transit-oriented developments where somewhat lower car ownership has been reported.¹⁰

MTC's recent report, "*Transit-Oriented Development: New Place, New Choices in the San Francisco Bay Area*" from November 2006, supports the proposition that transit-oriented development can reduce the rate of car ownership. According to this report, almost 30 percent of households living within a half-mile of a rail or ferry station do not own cars. Households closer to transit also log fewer daily miles on the cars they do own (20 miles per day for households less than a half-mile from transit, versus 39-55 miles per day for households living more than one mile from transit). Furthermore, households close to transit report a higher share of daily work and non work trips on foot or by bike than households farther from transit.

JOBS AND HOUSING

Over the last ten years, the supply of affordable housing in the Bay Area has not kept pace with job growth. Thus, new workers filling jobs must either pay very high prices to own or rent housing near their places of employment or move further away and face correspondingly longer commutes. The greatest projected need for additional housing, based only on projected future employment and population growth, is in San Francisco, Santa Clara and Alameda counties.¹¹ Table 2.12-6 compares the number of employed residents with the number of jobs projected for each county and indicates which counties are exporters of workers and which counties are importers.

⁷ Department of Finance, July 2007b.

⁸ Ibid.

⁹ Metropolitan Transportation Commission, 2006.

¹⁰ Caltrans, 2001, p. 5.

¹¹ Ibid.

Table 2.12-6: Employment by County – Net Importers/Exporters of Workers and Jobs/Housing Balance (Year 2005 and 2035)

Year 2005					
County	Employed Residents	Jobs	Difference (Jobs - Employed Residents)	Jobs/Employed Residents Ratio	Imports/Exports workers
Alameda	705,901	730,274	24,373	1.03	IMPORTS
Contra Costa	459,600	379,043	-80,557	0.82	EXPORTS
Marin	122,200	135,470	13,270	1.11	EQUAL ¹
Napa	64,100	70,695	6,595	1.10	EQUAL ¹
San Francisco	388,100	553,079	164,979	1.43	IMPORTS
San Mateo	318,600	337,346	18,746	1.06	IMPORTS
Santa Clara	734,002	872,866	138,864	1.19	IMPORTS
Solano	194,900	150,528	-44,372	0.77	EXPORTS
Sonoma	237,700	220,462	-17,238	0.93	EXPORTS
Region	3,225,103	3,449,763	224,660	1.07	IMPORTS
Year 2035					
County	Employed Residents	Jobs	Difference (Jobs - Employed Residents)	Jobs/Employed Residents Ratio	Imports/Exports workers
Alameda	1,131,199	1,099,554	-31,645	0.97	EXPORTS
Contra Costa	717,600	591,638	-125,962	0.82	EXPORTS
Marin	152,500	165,184	12,684	1.08	EQUAL ¹
Napa	85,400	98,566	13,166	1.15	EQUAL ¹
San Francisco	518,801	832,874	314,073	1.61	IMPORTS
San Mateo	468,000	521,991	53,991	1.12	IMPORTS
Santa Clara	1,326,601	1,365,827	39,226	1.03	IMPORTS
Solano	326,600	227,872	-98,728	0.70	EXPORTS
Sonoma	289,800	344,286	54,486	1.19	IMPORTS
Region	5,016,501	5,247,792	231,291	1.05	IMPORTS

¹ Defined as difference of 15,000 or less.

Source: MTC's Superdistrict and County Summaries of ABAG's Projections 2007 2000-2035 Data Summary, 2007

For the Bay Area as a whole, there will be more jobs in 2035 than employed residents, resulting in about 231,000 commuters from outside the Bay Area filling jobs within the nine-county region. If one were to gauge future housing need based on the projected future imbalance between numbers of jobs and numbers of employed residents, then San Francisco, San Mateo, and Sonoma counties in particular would be in need of additional housing for their respective workforces.

Growth-inducing potential can be affected at the local and corridor level by changes in the jobs-housing balance as local communities change General Plans and zoning and developers respond to perceived opportunities where there is an imbalance. A jobs-housing balance ratio compares the available housing and available jobs within a community, city or other geographically defined sub-region. Planning for a jobs-housing balance is based on the premise that the number of work

trips by car, the overall number of vehicle trips, and the resultant vehicle miles traveled can be reduced when there are sufficient jobs available locally to balance the employment demands of the community.

Planning for a jobs-housing balance builds on and integrates analyses of employment potential (existing and projected), housing demand (by income level and housing type), new housing production, and the relationship between employment opportunities and housing availability. Improving the jobs-housing balance so that the number of jobs is approximately the same as the number of employed residents— a ratio of 1:1—requires carefully planning for the location, intensity, and nature of jobs and housing in order to encourage a reduction in vehicle trips and miles traveled and a corresponding increase in the use of mass transit and alternative modes of transportation, such as carpools, bicycling, and walking.

Table 2.12-6 also shows the current and projected jobs-housing balance by county. The jobs-housing ratio can also be displayed in more detail by MTC superdistricts, as shown in Table 2.12-7. In theory, a 1:1 ratio would indicate balance and improved opportunities for reduced commuting distances when the types of jobs match the skills of the local residents (although commuting is not reduced where there are mismatches between jobs and worker skills, and income and housing affordability). An imbalance, particularly where there are fewer jobs than employed residents and the ratio is less than 1.0, can result in growth inducement as local officials and developers take actions to add non-residential land uses and increase the job base. These actions, in turn, can create pressure for additional growth. Also, if there is an imbalance in jobs and housing within a particular city, other cities may seek to fill the gap, whether it be housing or jobs to meet market demand. This can result in pressure for creation of jobs or housing in distant communities, and create a demand for additional infrastructure and services growth.

Table 2.12-7: Current and Projected Jobs/Housing Balance by MTC Superdistrict

Superdistrict	2005				2035				Difference
	Employed Residents	Jobs	Jobs/ Employed Residents Ratio		Employed Residents	Jobs	Jobs/ Employed Residents Ratio		
1 Downtown San Francisco	61,437	109,128	1.78		89,468	487,946	5.45		3.68
2 Richmond District	117,308	69,623	0.59		145,671	124,280	0.85		0.26
3 Mission District	147,509	110,755	0.75		206,976	188,799	0.91		0.16
4 Sunset District	61,846	85,095	1.38		76,686	31,849	0.42		-0.96
5 Daly City/San Bruno	127,554	60,654	0.48		188,278	222,426	1.18		0.71
6 San Mateo/Burlingame	95,637	52,916	0.55		137,011	131,340	0.96		0.41
7 Redwood City/Menlo Park	95,409	50,908	0.53		142,711	168,225	1.18		0.65
8 Palo Alto/Los Altos	76,363	99,620	1.30		124,743	163,578	1.31		0.01
9 Sunnyvale/Mountain View	107,816	45,080	0.42		212,606	438,894	2.06		1.65
10 Saratoga/Cupertino	134,031	25,615	0.19		204,302	161,112	0.79		0.60
11 Central San Jose	123,751	76,360	0.62		262,897	279,691	1.06		0.45
12 Milpitas/East San Jose	153,412	116,542	0.76		284,691	152,947	0.54		-0.22
13 South San Jose/Almaden	95,754	27,560	0.29		152,110	83,428	0.55		0.26
14 Gilroy/Morgan Hill	42,875	27,810	0.65		85,252	86,177	1.01		0.36
15 Livermore/Pleasanton	98,156	59,091	0.60		190,795	216,338	1.13		0.53
16 Fremont/Union City	154,817	48,569	0.31		244,288	220,590	0.90		0.59
17 Hayward/San Leandro	165,206	109,128	0.66		241,134	202,664	0.84		0.18
18 Oakland/Alameda	202,937	69,623	0.34		329,962	322,900	0.98		0.64
19 Berkeley/Albany	84,785	110,755	1.31		125,020	137,062	1.10		-0.21
20 Richmond/El Cerrito	108,544	85,095	0.78		160,667	112,385	0.70		-0.08
21 Concord/Martinez	110,544	60,654	0.55		169,250	173,293	1.02		0.48
22 Walnut Creek/Lamorinda	65,233	52,916	0.81		91,579	103,776	1.13		0.32
23 Danville/San Ramon	61,647	50,908	0.83		102,612	88,792	0.87		0.04
24 Antioch/Pittsburg	113,632	99,620	0.88		193,492	113,392	0.59		-0.29
25 Vallejo/Benicia	70,089	45,080	0.64		110,363	74,864	0.68		0.04
26 Fairfield/Vacaville	124,811	25,615	0.21		216,237	153,008	0.71		0.50
27 Napa	45,546	76,360	1.68		63,104	70,493	1.12		-0.56
28 St. Helena/Calistoga	18,554	116,542	6.28		22,296	28,073	1.26		-5.02
29 Petaluma/Sonoma	84,179	27,560	0.33		99,318	119,962	1.21		0.88
30 Santa Rosa/Sebastopol	112,307	27,810	0.25		139,396	186,829	1.34		1.09
31 Healdsburg/Cloverdale	41,214	59,091	1.43		51,086	37,495	0.73		-0.70
32 Novato	27,286	48,569	1.78		36,874	38,879	1.05		-0.73
33 San Rafael	49,980	109,128	2.18		60,924	68,665	1.13		-1.06
34 Mill Valley/Sausalito	44,934	69,623	1.55		54,702	57,640	1.05		-0.50

Source: MTC Superdistrict and County Summaries of ABAG's Projections 2007 2000-2035 Data Summary, 2007

IMPACT ANALYSIS

SIGNIFICANCE CRITERION

Growth-inducing effects would be considered significant if implementation of the Transportation 2035 Plan contributes directly or indirectly to substantial unanticipated increases in population or jobs beyond those currently projected by ABAG.

GROWTH-INDUCING EFFECTS OF TRANSPORTATION 2035 PLAN

As indicated in Table 2.12-1, the population of the Bay Area and all nine Bay Area counties is projected to grow by about 2 million people between 2005 and 2035. This population growth is expected to occur with or without the new investments proposed in the Transportation 2035 Plan, since the factors most affecting population growth are birth rates, in-migration, job opportunities, housing availability, and climate. In urbanized areas, the availability of developable land, and, increasingly, opportunities for redevelopment, also have a major influence on where growth can take place. The quality of the regional transportation system serving the San Francisco Bay Area has a limited role in stimulating overall growth compared to these other factors.

All things considered, it is unlikely that the transportation system operations, maintenance, improvements, and expansion contemplated in the proposed Transportation 2035 Plan will be of sufficient magnitude, compared to the in-place transportation system, to stimulate new growth beyond the 27 percent increase in population and 52 percent increase in jobs that are already projected by ABAG. There are five primary reasons for this conclusion:

1. Historically, transportation investment in general, and increased transportation capacity in particular, lag behind the growth that occurs in the Bay Area (for example, Route 4 in eastern Contra Costa County and US 101 in northern Marin and Sonoma counties). The proposed Transportation 2035 Plan adds 1,120 roadway lane miles (6 percent increase) and 600,000 transit seat miles (18 percent increase); this supply does keep pace with the 26 percent increase in population and 50 percent increase in jobs. The situation is likely to continue with the limited fiscal resources for expansion of transportation system capacity.
2. Due to the maturity of development in the region and the existing transportation system and mode choices already available, incremental corridor improvements are expected to play a minimal role in attracting or inducing new development to the region as a whole. The regional health of the economy, the diversity of arts and cultural activities, the stature of the educational system, particularly the universities and their research programs, the strength of local, regional and international markets, and interregional transportation costs are all more important influences on interregional location decisions.
3. Most of the local agencies in the Bay Area with land use jurisdiction over territory that lies along the urban/rural boundaries have adopted growth management plans, urban limit lines, urban reserve areas, community separators, conservation easements, parks, greenbelts, agricultural land preservation trusts, performance standards, and large lot rural and agricultural zoning to manage urban sprawl, irrespective of the presence or absence of interregional transportation facilities that connect urban centers (see research cited in *Chapter 2.3: Land Use*). Many jurisdictions have also adopted incentive programs

for infill development, particularly in transit corridors and around rail transit stations, some of which are supported by MTC's Transportation for Livable Communities (TLC) program.

4. Perhaps in part due to the growth management efforts of Bay Area communities, population growth is limited by the historic inability of the Bay Area to provide affordable housing to meet demand, resulting in a worker surplus in 2005 (total employment minus employed residents) of almost 225,000 (see Table 2.12-6). Generally speaking, these are people living outside the nine-county region and commuting into the Bay Area to work. While improvements to specific transit stations or roadways may make parts of the Bay Area relatively more attractive places to live or work than they have been in the past, virtually all parts of the Bay Area are already in high demand, and the Transportation 2035 Plan does not alleviate the existing challenges of restricted housing supply or escalating housing costs.
5. The rising cost of gasoline (though unpredictable over the past year), coupled with a burgeoning concern for sustainable development and climate change, seem to be resulting in changes in local land use and investment decision-making geared toward fewer car trips, smaller cars, transit accessibility, infill development, and overall reduced environmental impacts of Bay Area lifestyles. Through the FOCUS effort, regional agencies (MTC, ABAG, BCDC, and BAAQMD) are working together with local jurisdictions to create complete, livable communities in Priority Development Areas (PDAs) and preserve open space.

Based on these observations about the nature of population and job growth in the Bay Area, the indirect effects of the proposed Transportation 2035 Plan on long-term population and economic growth are expected to be minimal.

As indicated in Chapter 2.1 of this EIR, overall mobility in the region will be more constrained in 2035 than it was in 2005, even with implementation of the Transportation 2035 Plan. There will be more peak period congestion, more total vehicle hours of delay and slower average speeds on roadways. However, there is also expected to be more accessibility to jobs within 15, 30 and 45 minute commutes as a result of strategic improvements in connectivity within the region. Still, increasing congestion could discourage new firms from locating in the Bay Area or cause some existing firms to consider relocating away from the region. Consequently, to the extent that the transportation network has any effect on regional growth, it is likely that insufficient transportation infrastructure may decrease, rather than increase, the projected rates of population and employment growth.

While the Transportation 2035 Plan is not expected to stimulate overall regional population and employment growth, the priority-setting processes and the availability of funding to pay for planned projects could affect the way the Plan is implemented. These decisions, in turn, could potentially have consequences for local growth and land development in some parts of the region over the coming twenty-five years, but these effects would likely be consistent with *Projections 2007*. *Projections 2007* is not strictly a trends-based forecast, but is based on detailed analysis of land use policies and potential for smart growth. ABAG introduced smart growth assumptions into the regional population forecasts starting with *Projections 2003*. Under *Projections 2007*, over the next 25 years, the share of population growth would increase in the most urbanized

counties and decrease in the least urbanized counties, reflecting the idea of infill and greater densities within existing urban areas (see Table 2.12-1).

Some transportation improvements in the Transportation 2035 Plan could have localized effects on the timing and location of development, particularly infill development and urban redevelopment. The Plan provides for an increase in transit supply (transit seat miles increase by 18 percent) substantially larger than that of highway capacity (a 3 percent increase in roadway lane miles). In this respect, the Transportation 2035 Plan has a city-centered focus that is consistent with *Projections 2007*, and gives priority to transportation improvements that serve urbanized locations. For example, the Commission has committed \$2.2 billion towards MTC's Transportation for Livable Communities program to support the development of higher density housing, mixed uses and jobs in existing communities near transit. In some areas, improved transit might be one factor facilitating urban infill development and improving jobs-housing balance. To the extent that occurs, the transit improvements contained within the proposed Transportation 2035 Plan could be seen to support infill development or urban redevelopment. While any decision to amend local general plans for higher density or a better jobs-housing balance remains a local decision, the proposed Transportation 2035 Plan may have the effect of supporting more population or employment growth in these areas with good transit access than is currently anticipated in the local general plans. Improving the jobs-housing balance in this way is an alternative to urban sprawl and regional growth outside of urban areas, and does not necessarily contribute to growth of the regional population as a whole. This type of localized growth near transit is consistent with ABAG's *Projections 2007*.

In conclusion, the proposed Transportation 2035 Plan is not likely to have an overall regional population or employment growth-inducing effect. Rather, provision of transportation infrastructure is expected to continue to lag behind regional population and employment growth during the term of the Plan. Localized densification effects, if any, would not represent growth beyond what is anticipated by *Projections 2007* for urban areas or for the overall region.

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3.1 Alternatives to the Project

The CEQA document for the proposed development and planning process will include a detailed discussion of the proposed project and the proposed development. The proposed development is a proposed project in the proposed development area. The proposed development is a proposed project in the proposed development area. The proposed development is a proposed project in the proposed development area.

The CEQA document will also include a discussion of the proposed project and the proposed development. The proposed development is a proposed project in the proposed development area. The proposed development is a proposed project in the proposed development area. The proposed development is a proposed project in the proposed development area.

Part Three

Alternatives and CEQA-Required Conclusions

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ALTERNATIVES DISCUSSION

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ENVIRONMENTAL ALTERNATIVES REVIEW

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3.1 Alternatives to the Project

This chapter documents the alternatives development and screening process and analyzes several alternatives identified during preparation of the proposed Transportation 2035 Plan. Key features of each alternative are presented, and potential impacts are discussed and compared to the impacts of the proposed Transportation 2035 Plan.

The CEQA Guidelines require EIRs to describe a reasonable range of potentially feasible alternatives to a proposed project or program. That is, the EIR needs to analyze only those alternatives that will help decision-makers make reasoned choices. The range of alternatives shall include those that “would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project” (CEQA Guidelines, Section 15126.6(a)). “Feasible” means that the alternatives “are capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social and technological factors” (CEQA Guidelines, Section 15364). In addition, the EIR must evaluate the No Project alternative, which allows decision makers to compare the impacts of approving the project with the impacts of not approving the project.

If the alternatives themselves would have significant environmental impacts, the EIR must identify them. The alternatives may result in new impacts that do not result from the proposed Project. The EIR need not analyze these alternatives at the same level of detail that it analyzes the project itself. The CEQA Guidelines require only that the EIR provide enough information to allow meaningful evaluation, analysis and comparison. Quantified information on the alternatives is presented where available; however, in some cases only partial quantification can be provided because of data or analytical limitations.

Finally, the CEQA Guidelines require each EIR to identify the environmentally superior alternative among the alternatives analyzed. If the No Project alternative is the environmentally superior alternative, the EIR must select another alternative from among the alternatives analyzed.

ALTERNATIVES SCREENING

An extensive screening process was conducted to identify potential Plan alternatives and to ultimately identify a reasonable range of alternatives for full evaluation in this EIR.

PRELIMINARY ALTERNATIVES REVIEW

In July 2007, the MTC Planning Committee directed staff to conduct a vision scenario analysis of three infrastructure scenarios relative to a set of specific performance targets for reducing congestion, vehicle miles traveled, and carbon dioxide and particulate matter emissions, and housing/transportation costs for working families. The three infrastructure packages were as follows: (1) freeway performance package that utilizes technology such as traffic operation systems (TOS), ramp meters, and communication equipment to improve system performance (which is collectively called the Freeway Performance Initiative); (2) a Regional High-Occupancy Toll (HOT) Network supported by a robust system of express and local bus services; and (3) a Regional Rail and Ferry scenario that calls for major improvements and expansions of the existing rail and ferry networks. This analysis applied land use and pricing sensitivity tests to each

infrastructure scenario to see how such policy measures could help the region achieve its performance targets. The key findings from this scenario analysis were that investing in infrastructure improvements alone had minimal effect on improving system performance and mobility relative to the targets. However, aggressive pricing strategies that increased the cost of driving had a much bigger effect in the short-term in moving the region closer to meeting the targets. Also, aggressive land use strategies that called for compact development in existing communities near transit also had a much greater influence over the long-term towards meeting the targets.

From this early vision scenario analysis, MTC generated a preliminary range of project alternatives for consideration in the EIR, and included them in the Notice of Preparation (NOP) for public comments (see Appendix A). These preliminary alternatives—the No Project, Financially Constrained, New Pricing Concepts, and New Non-Pricing Concepts—were designed to attain most of the Transportation 2035 Plan goals and potentially lessen the Plan’s environmental effects. MTC discussed these preliminary alternatives with the Bay Area Partnership and its Technical Advisory Committee¹ and presented these alternatives at the two public EIR scoping meetings.

Subsequently, as part of the investment tradeoffs and decision making process that is described in *Chapter 1.2: Overview to the Transportation 2035 Plan*, MTC performed a detailed project-level assessment for a subset of projects and programs to include in the Transportation 2035 Plan – the proposed Project. The assessment included a quantitative appraisal to measure benefit/cost with respect to the performance objectives and a qualitative policy assessment to reflect the somewhat broader considerations embodied in the Three Es and plan goals. The purpose of the project-by-project assessment was to identify outliers—projects that most strongly support the plan’s performance objectives and goals, and those projects that most obviously do not support the performance objectives and goals. The Commission’s intent was to include the highest-performing projects (those that both yield a high financial return for each dollar invested and address multiple goals), and to exclude the lowest-performing projects (those that cost more than the benefits produced and address only a few goals.)

The Commission ultimately considered both the performance results and partner/public input in deciding on the set of transportation projects to be included in the financially constrained plan. As such, “high performers” such as the Freeway Performance Initiative, Regional HOT Network, and transit efficiency projects are included in the proposed Project, along with “lower performers” such as the Lifeline Transportation Program, Transportation Climate Action Campaign, and some freeway and expressway widening, interchange improvements, and local circulation improvement projects. The Commission aimed to provide a balanced portfolio of investments in the areas of system maintenance, efficiency and expansion to relieve present and future traffic congestion, accommodate increases in travel demand caused by projected

¹ The Bay Area Partnership Board is comprised of the top staff of various transportation agencies in the region (MTC, public transit operators, county congestion management agencies, city and county public works departments, ports, Caltrans, U.S. Department of Transportation) as well as environmental protection agencies. The Partnership works by consensus to improve the overall efficiency and operation of the Bay Area’s transportation network, including developing strategies for financing transportation improvements.

population and job growth, and help the region make progress in attaining the Three Es, plan goals and performance objectives. The investment strategy approved by the Commission is reflected in the proposed Project.

ALTERNATIVES IDENTIFIED DURING EIR SCOPING

In response to the NOP, MTC received and evaluated several comment letters and oral comments containing recommendations regarding alternatives. Below is a summary of public/agency comments regarding alternatives and information on why these suggestions were either included or not included for full evaluation in the EIR.

- The various alternatives proposed should analyze realistic inputs and assumptions in addition to analyzing what needs to be achieved to meet the targets adopted by the Commission; this applies to land use assumptions, which in addition to an aggressive development scenario, should be based on the latest Projections as required by state law; the alternatives analyzed should clearly document the level of transportation dollars that are expected in the next 25 years versus the needs to show disparity between resources and needs; the eligibility criteria for the various fund sources should be documented and tied to the projects and programs proposed so that it is obvious that what is proposed in the financially constrained alternative is indeed fundable (Alameda County Congestion Management Agency, letter dated March 19, 2008).

The latest ABAG projections (*Projections 2007*) were used as the underlying socioeconomic demographic assumptions for the proposed Project and the alternatives, with one exception – an alternative land use strategy was examined as part of Alternative 4 (described below). The evaluation of the proposed Project against the performance objectives adopted by the Commission was conducted separately from the EIR, as these are not CEQA issues in and of themselves and are not necessarily the same as the thresholds of significance for CEQA purposes. The financial assumptions for the set of projects and programs identified for inclusion in the financially constrained plan were examined as part of the Transportation 2035 planning process.

- Alternatives should be defined solely as different lists of investments to distinguish changes produced by the alternatives versus the proposed Project; pricing alternatives and “other” alternatives should be run as sub-alternatives on each of the alternatives to allow comparisons amongst alternatives; one pricing sub-alternative should focus on freeway congestion pricing and the other sub-alternative center on moderate congestion relief; an emissions-reduction alternative comprised of a transportation network designed to reduce greenhouse gas emissions should be evaluated, and the TRANSDEF Smart Growth alternative from the Transportation 2030 EIR should be revised for this purpose (TRANSDEF, letter dated March 20, 2008 and oral comments at March 13, 2008 EIR scoping meeting).
- Pricing as a sub-alternative, or sensitivity analysis, to the other alternatives should be applied; having smart land-use and better pricing as separate alternatives makes it impossible to isolate which changes from the proposed Project actually produces the results; for that reason the different alternatives should be defined solely as different lists of investments—combinations of projects and programs; this would help decision-makers decide on which pricing and land use interventions are likely to have the greatest impact under a range of investment scenarios (TALC, letter dated March 20, 2008).

The suggestion to define alternatives as different investments is a reasonable one. During late spring 2008, the Commission discussed various investment priorities for the financially constrained plan and the tradeoffs that must be made amongst the priorities given that need exceeds resources available. This tradeoff discussion was focused primarily on how much funding should go towards maintaining the existing transit, local roadway and State highway systems and how much funding should go towards projects that help advance the plan's goals, particularly the goal of climate protection. The Heavy Maintenance/Climate Protection Emphasis alternative (which is described in more detail below) reflects an alternative investment strategy to the one contained in the proposed Project.

The suggestion to evaluate pricing and land-use strategies within the context of a sensitivity analysis (i.e., sub-alternatives) is also reasonable. However, rather than combining pricing and land use strategies together as part of an alternative, MTC conducted separate sensitivity analyses. These analyses help to distinguish how the environmental impacts of an alternative coupled with pricing strategies would differ from an alternative coupled with more focused growth land-use strategies.

MTC considered the suggestion to re-evaluate a modified TRANSDEF Smart Growth alternative that is designed to reduce greenhouse gas emissions. MTC has previously examined the TRANSDEF Smart Growth alternative as part of the Transportation 2030 EIR², and more recently, MTC, in partnership with ABAG, also tested the impacts of its own aggressive pricing and land use strategies as part of the vision scenario analysis for the Transportation 2035 Plan. Based on these analyses, MTC found that re-evaluating the proposed TRANSDEF alternative would not produce markedly different results compared to the prior Transportation 2030 EIR and Transportation 2035 vision scenario analyses, and therefore would not provide the Commission with new or meaningful information for use in its decision-making. Also, more importantly, the Transportation 2030 EIR raised concerns about the feasibility of the underlying assumptions for the TRANSDEF Smart Growth alternative, including the deletion of over 200 committed, fully funded projects from the network definition and the addition of new transit services without operating funds. Furthermore, transit shortfalls remain in the proposed Transportation 2035 Plan; these shortfalls must be addressed prior to adding new transit services without operating and capital maintenance funds. For these reasons, MTC found this alternative suggestion to be infeasible.

- The EIR should evaluate the greenhouse gas emissions impacts of the alternatives, and study an alternative that includes substantially more focused growth, such as higher density development scenarios created by ABAG. (Greenbelt Alliance, letter dated March 20, 2008)

MTC evaluated the greenhouse gas emissions impacts of the alternatives, and as explained above, applied the aggressive land use strategies developed by ABAG as part of the alternatives analysis (see Alternative 4).

² See also MTC, Draft EIR for the Transportation 2030 Plan (October 2004)

- Each alternative should compare the level of transit service by transit operator (as well as bus versus rail) in each county; the estimated cost per rider for each alternative should also be calculated; each pricing mechanism should be evaluated by community of concern and income quintile to gauge the equity impact; wherever possible the benefits of bus riders versus rail or other mode should be evaluated; the TRANSDEF proposal should be evaluated and in particular for their relative equity impacts by communities of concern, income quintile and/or by benefits to bus riders versus rail or other modes (Urban Habitat, letter dated March 20, 2008).

In general, a program-level EIR evaluates the broad environmental impacts of a program of projects, in which impacts are identified on a regional basis, rather than by individual community. Also, CEQA does not require assessment of social and economic impacts unless they result in a physical impact on the environment. This EIR does not specifically analyze the economic impacts of pricing strategies on communities of concern, nor analyze the air quality impacts of individual communities of concern, nor distinguish the cost per rider on each public transit system for each alternative.

However, MTC prepared a separate, more detailed equity analysis, as done for past RTPs, which gauged the equity impacts associated with the proposed Project and alternatives.³ This equity analysis evaluated plan expenditures per household (low-income versus all other households); access to low-income jobs within 30 minutes by auto and transit in communities of concern versus remainder of the region; access to non-work activities within 30 minutes by auto and transit in communities of concern versus the remainder of the region; toxic air contaminant emissions in communities of concern versus the remainder of the region; and housing and transportation affordability in communities of concern versus the remainder of the region. Each indicator was evaluated in terms of absolute change between the existing conditions and the proposed Project and between the proposed Project and No Project alternative.

- The EIR should consider an alternative that, where feasible, “eliminates from the Proposed Transportation Plan so-called ‘committed’ projects that would contribute to adverse cumulative impacts on climate.” MTC should shift the \$29 billion in committed revenue for transit and roadway expansion to transportation investments that improve and expand urban and suburban core transit, programs for walkability, bicycling and other alternative modes, transit access, housing near transit, and local blueprint plans that coincide with the regional blueprint; at least one alternative should be designed to maximize the reduction of greenhouse gas emissions; there are many policies and/or projects that MTC could consider to help achieve this goal, some of which it already considered and could fund at significantly higher level; some possibilities include the following: focus on eliminating transit shortfalls; increase service capacity to meet increased demand for public transit in the urban core areas; increase funding for transportation infrastructure to serve infill and mixed use development,

³ See MTC’s Transportation 2035 Equity Analysis Report (January 2009). This report, along with other technical supplemental reports for the Transportation 2035 Plan, is posted on MTC’s website <www.mtc.ca.gov>.

increase incentives for use of public transit, ridesharing and carpools, and expanded transit frequency for operation (California Attorney General, letter dated October 1, 2008).

MTC considered the suggestion to shift the \$29 billion in committed funds for transit and roadway expansion included in the proposed Project for other uses, but did not carry this alternative forward for full EIR analysis because of the infeasibility of reallocating (or shifting) such funds. As discussed in Chapter 2.1 (Overview), MTC evaluated the committed transit and road expansion projects that make-up the \$29 billion, and found that (1) most of the projects are in the advanced stages of project development (design, right-of-way and construction); (2) most projects are funded by local, regional, state, or federal funds that are obligations that MTC has no discretion to redirect; and (3) most projects meet one or more of the plan's goals. Only a few projects were still in the early planning and environmental phase of project development, had funds from other state or federal funds subject to MTC discretion, and met only one goal. In its review of the staff evaluation and consideration of public comments, the Commission determined that it was not feasible to shift the funds away from these projects because the projects are meritorious in providing mobility of goods, services and people and because of long-standing local and regional commitments to delivering these projects.

To address the Attorney General's suggestion to evaluate an alternative that reduces greenhouse gases, MTC revised the Heavy Maintenance alternative to reflect increased funding levels for projects that maximize maintenance investments and reduce greenhouse gas emissions. This is accomplished by shifting the \$26 billion in uncommitted discretionary revenues (which the Commission has authority to direct to specific uses) to cover transit and local roads maintenance shortfalls and to increase funding for transportation projects that support walking, bicycling and transit use and infill and mixed use development in existing communities near transit. This is reflected in the Heavy Maintenance/Climate Protection Emphasis alternative, which is described and analyzed in the following section.

- An alternative with respect to equity that says trucks can go on I-580 should be evaluated (Greg Harper, oral comment at March 10, 2008 EIR scoping meeting).

MTC evaluated particulate matter emissions of the proposed Project as part of the air quality analysis. However, because the State of California, not MTC, has the authority as the owner and operator of the State highway system to designate I-580 as a truck route, an alternative that designates I-580 as a truck route is not considered feasible. (CEQA Guidelines, Section 15364.)

ALTERNATIVES ANALYZED IN THIS EIR

This EIR evaluates the No Project alternative as required by CEQA, as well as three other alternatives developed through the screening process. As with the proposed Transportation 2035 Plan, ABAG's *Projections 2007* serve as the underlying demographic and land use assumptions for the EIR analysis of alternatives, with specific exceptions noted. The descriptions of the alternatives are provided below, followed by an analysis that compares the environmental impacts of each alternative to the proposed Project. A complete listing of projects by alternative is provided in Appendix C.

ALTERNATIVE 1: NO PROJECT

The No Project alternative addresses the effect of not implementing the Transportation 2035 Plan. This alternative includes a set of transportation projects and programs that are in advanced planning stages and slated to go forward since they have full funding commitments. (Therefore, the No Project alternative is not equivalent to existing conditions.) These projects are: (1) identified in the federally required Fiscal Year 2009 Transportation Improvement Program, a four-year funding program of Bay Area projects and programs, (2) not yet in the TIP but are fully funded sales tax projects authorized by voters in seven Bay Area counties, including San Francisco, Santa Clara, San Mateo, Alameda, Contra Costa, Sonoma and Marin, or (3) not yet in the TIP but fully funded through other committed funds as defined by statute or Commission policy. This alternative does not include transportation projects and programs funded by the \$32 billion in uncommitted discretionary funds.

ALTERNATIVE 2: HEAVY MAINTENANCE/CLIMATE PROTECTION EMPHASIS

This alternative is financially constrained to the \$220 billion projected revenue available to the region over the next 25-years. Unlike the proposed Project, this Heavy Maintenance/Climate Protection alternative places its investment emphasis almost entirely on system maintenance and efficiency projects that support the plan goals.

This alternative maximizes the use of available discretionary funds for investments that (1) reduce shortfalls for transit and local roadway maintenance; (2) improve walkability, bicycling, transit access, and carpooling and ridesharing; (3) help local jurisdictions to plan and build housing near transit; and (4) implement public education and outreach programs to raise awareness and facilitate behavior changes that help the region to meet its climate protection goal. The set of projects and programs in this alternative is designed to reduce vehicle miles traveled and/or greenhouse gas emissions.

This alternative retains the plan expenditures for the \$194 billion in committed funds because these funds are committed to specific uses by statute or Commission policy, but redirects uncommitted discretionary revenues. Because this alternative focuses on system maintenance and efficiency, it excludes all expansion, including the Regional HOT Network and the transit and roadway expansion projects that in the proposed Project are funded in part by the \$32 billion discretionary funds. As a result of the exclusion of the Regional HOT Network, the \$6.1 billion in net revenue that the Regional HOT Network would generate is not available to fund corridor improvements (such as transit operating and capital needs, freeway operations, interchanges, roadway maintenance and local access improvements). This leaves \$26 billion in uncommitted discretionary funds that can be redirected to other project priorities, as follows:

- \$11 billion of the \$21 billion transit capital maintenance shortfall (this is a \$4.6 billion increase in the funding level from the proposed Project);
- \$9 billion of the \$18 billion local roadway shortfall (this is a \$2 billion increase in the funding level from the proposed Project);
- \$3 billion to the Transportation for Livable Communities Program, which provides capital funds to improve pedestrian, bicycle and transit access and planning funds to create station area plans for housing/mixed uses near transit stations/stops (this is a \$900 million increase in the funding level from the proposed Project);

- \$1.3 billion to the Regional Bicycle Program (this is a \$300 million increase in the funding level from the proposed Project for purposes of completing the commuter routes of the regional bicycle network and providing bicycle access on toll bridges);
- \$900 million to the 5-year Transportation Climate Action Campaign, which includes outreach/education programs, Safe Routes to Schools, Safe Routes to Transit, climate grants/incentives, and transit priority measures to improve bus transit speed and reliability (this is a \$500 million increase in the funding level from the proposed Project); and
- \$1.1 billion to the Lifeline Transportation Program, which addresses the mobility needs of low-income communities by providing funding to projects such as transit capital and operations, community shuttles, pedestrian infrastructure improvements, auto-based programs, demand-responsive services for seniors and children, transportation outreach and information projects, and programs providing fare assistance (this is a \$400 million increase in discretionary funding in addition to the \$300 million previously committed in the proposed Project).

ALTERNATIVE 3: HEAVY MAINTENANCE/CLIMATE PROTECTION EMPHASIS + PRICING STRATEGIES

This alternative reflects the same project definition as Alternative 2 (Heavy Maintenance/Climate Protection Emphasis) plus it includes applying user-based pricing strategies in order to determine how pricing might influence the performance of infrastructure investments. The pricing strategies are intended to induce changes in travel behavior by increasing the cost of driving. They include: (a) carbon tax or tax on vehicle miles driven, (b) congestion fee for using congested freeways during peak periods, and (c) increased parking charges.

To represent the carbon tax or VMT tax, gas prices are assumed to increase by 21 percent from \$7.47 per gallon to \$9.07 in 2035 (all in 2008 current dollars). Overall, the total auto operating cost per mile would also increase by 21 percent, from 39 cents per mile to 47 cents per mile. For the congestion fee, a charge of 25-cents per mile on congested freeways is added to freeway segments where the volume-to-capacity ratio exceeds 0.90 (very congested facilities). For the parking charge, parking costs are increased by \$1.00 per hour to both peak and off-peak trips. This impacts both work and non-work trips, and has a higher impact on short trips than long trips. So, these increased parking costs will end up showing more non-motorized (bicycling and walking) trips in the pricing tests. The aggregate effect of these pricing strategies is a substantial increase in auto operating cost. This alternative aims to encourage more people to bike, walk and take transit, drive less, and produce less transportation-related greenhouse gas emissions by making it very expensive to drive.

MTC tested these pricing strategies as part of the vision scenario analysis in fall 2007 in response to expressed interest by the State legislators to pursue a carbon tax, VMT tax or congestion pricing and public interest to increase parking charges. These pricing strategies were tested under this alternative for CEQA evaluation purposes. At this time, MTC has no legislative authority to implement the pricing strategies described in this alternative.

ALTERNATIVE 4: HEAVY MAINTENANCE/CLIMATE PROTECTION EMPHASIS + LAND USE STRATEGIES

This alternative reflects the same project definition as Alternative 2 (Heavy Maintenance/Climate Protection Emphasis) plus it includes an alternative land use forecast in order to determine how a different kind of regional growth might influence the performance of infrastructure investments. This alternative land use forecast is a policy forecast, as opposed to a purely market-driven outcome. ABAG staff produced this alternative land use forecast with the objective of balancing jobs and housing and targeting growth in existing communities and near transit. Compared to *Projections 2007*, this forecast reflects considerable shifts in regional growth away from the fringes and toward existing employment and housing centers, areas projected to have either household or employment growth, and areas with existing and/or planned transit. It also assumes fewer in-commuters from neighboring regions by accommodating 37,000 more households within the Bay Area. This alternative assumes no pricing strategy.

This alternative is expected to maximize transit use and reduce auto trips and vehicle miles traveled because the land use strategy places projected population growth near existing and planned transit services and employment centers. However, much of the land surrounding existing and planned transit stations may not be currently zoned for higher density residential and commercial uses. To encourage transit-oriented development, local land use policy will need to be modified to allow for higher densities than currently allowed and to revise parking regulations to support transit-oriented development.

This alternative assumes that the regional planning agencies of ABAG, the Bay Area Air Quality Management District (BAAQMD), the Bay Conservation and Development Commission (BCDC) and MTC will collaborate to promote and achieve more focused urban growth than estimated in *Projections 2007*, in part through existing and planned programs and improvements contemplated by this alternative. Specific policy approaches have not been selected, however, some possible examples of regional policy approaches and implementation mechanisms to achieve the alternative land use forecast include increasing public awareness of the impacts of travel and location decisions, continuing to coordinate with local governments on land use decisions and parking policies and standards that impact transportation investments and vice versa, providing financial incentives to support Priority Development Areas (PDAs), and expanding the MTC Transit-Oriented Development Policy to include minimum employment densities and regional transit centers. The regional agencies must also work with local jurisdictions to modify the land use elements of their general plans, which is a key driver to implementing this land use strategy.

COMPARATIVE IMPACT ANALYSIS OF ALTERNATIVES

This section compares the environmental impacts of each alternative to the proposed Project, by resource issue area. The primary differences between the proposed Project and the alternatives are assumptions about infrastructure expansion, assumptions about future land use development and distribution, and assumptions about the cost to consumers of using the transportation system.

The Heavy Maintenance/Climate Protection Emphasis alternative focuses discretionary funds on covering transit and local roads maintenance shortfalls, funding climate, bicycle, pedestrian, lifeline and livable communities programs, and continuing funding for Resolution 3434 transit

expansion projects and other transit improvements. It excludes major new infrastructure investments such as the Regional HOT Network, Freeway Performance Initiative, and road and transit expansion projects that are included in the proposed Project. For the most part, this results in reduced road and transit supply which has relatively lower potential for physical environmental impact than that which is present in the proposed Project. This holds true for the two related Heavy Maintenance/Climate Protection Emphasis alternatives with Land Use and Pricing variations. However, while the Heavy Maintenance/Climate Protection Emphasis alternatives can be expected to have fewer physical impacts overall due to less construction of new infrastructure, these alternatives may also result in more congestion in those areas where necessary new capacity (auto or transit) is not provided. The land use and pricing assumptions also result in subtle differences in the impact and effectiveness of these alternatives.

The proposed Project, No Project, Heavy Maintenance/Climate Protection Emphasis, and Heavy Maintenance/Climate Protection Emphasis + Pricing alternatives all share the same basic regional land use assumptions provided in *Projections 2007*. The Heavy Maintenance/Climate Protection Emphasis + Land Use alternative, however, assumes denser and more city/transit-centric development than *Projections 2007*. It may therefore be generalized that the Heavy Maintenance/Climate Protection Emphasis + Land Use alternative would result in somewhat less cumulative impact related to open space land conversion and other natural area impacts, but would, on the other hand, result in potentially more impact on the existing urban spatial structure, particularly around transit stations and along target development corridors.

The proposed Project, No Project, Heavy Maintenance/Climate Protection Emphasis, and Heavy Maintenance/Climate Protection Emphasis + Land Use all share the same transportation pricing assumptions such as parking fees and transit fares. The Heavy Maintenance/Climate Protection Emphasis + Pricing alternative, however, assumes an increase in the cost of driving implemented through methods such as carbon taxes, taxes on vehicle miles driven, congestion fees for using congested freeways during peak periods, and increased parking charges. It may therefore be generalized that the Heavy Maintenance/Climate Protection Emphasis + Pricing alternative would result in somewhat less impact from single-occupancy vehicle miles traveled (emissions, congestion) in relation to the other alternatives.

TRANSPORTATION

Proposed Transportation System Capacity Increases (Supply)

Table 3.1-1 presents the differences in the supply of the transportation system among the alternatives. Key highlights are as follows:

- Because the proposed Project includes discretionary funding for roadway and transit expansion projects beyond those that are already committed, it results in the greatest increase in transportation supply. The proposed Project adds a six percent increase in total roadway lane miles (1,120 lane miles) and an 18 percent increase in transit seat miles (600,000 seat miles) over existing conditions due to the investments in the proposed Transportation 2035 Plan.
- The No Project alternative and the three Heavy Maintenance/Climate Protection Emphasis alternatives have the same level of transportation supply, which is two percent fewer roadway lane miles and ten percent fewer transit seat miles compared to the proposed Project. These alternatives do not include the set of roadway and transit expansion projects funded by

discretionary funds that are reflected in the proposed Project. The No Project alternative only includes committed projects and programs, while the three Heavy Maintenance/Climate Protection Emphasis alternatives direct discretionary funding not towards expansion projects but towards investments in maintenance, shortfalls, and efficiency projects and programs that attempt to improve system performance without expanding transportation system capacity.

Projected Changes in Transportation Mode and Vehicle Travel

Table 3.1-2 shows the differences in regional travel activity amongst the alternatives. Key highlights are as follows:

- Due largely to the increase in the cost of driving, the Heavy Maintenance/Climate Protection Emphasis + Pricing alternative provides the most reduction in trips by auto (6 percent fewer auto trips than the proposed Project) and most increase in transit trips (16 percent increase in transit trips over the proposed Project), bicycle trips (35 percent increase in transit trips over the proposed Project), and walk trips (28 percent increase in walk trips over the proposed Project).
- Compared to the proposed Project, daily transit boardings decrease by 5 percent under the Heavy Maintenance/Climate Protection alternative but increase by 2 percent with the addition of aggressive land use strategies under the Heavy Maintenance/Climate Protection Emphasis + Land Use and 16 percent with the addition of aggressive pricing strategies under the Heavy Maintenance/Climate Protection + Pricing alternative.
- The amount of daily vehicle miles traveled decreases by 5 percent under the Heavy Maintenance/Climate Protection Emphasis + Pricing alternative and 1 percent under the Heavy Maintenance/Climate Protection Emphasis + Land Use alternative compared to the proposed Project. The reduction in daily vehicle miles traveled is attributable to the effects of aggressive pricing and land uses strategies which makes auto use less attractive compared to other modes and places housing much closer to jobs and essential services, thus resulting in shorter trips and more biking and walking.
- Vehicle hours of delay is lowest for the proposed Project (36 percent reduction compared to the No Project alternative) due primarily to investments in the Freeway Performance Initiative and Regional HOT Network. More specifically, FPI provides for: (1) ramp meters that spread platoons of entering vehicles to improve merging maneuvers and reduce delays to freeway traffic, (2) closed circuit television cameras and traffic monitoring stations that detect incidents, (3) communication of incidents to the regional Transportation Management Center (TMC) so that those incidents can be responded to and cleared as quickly as possible to reduce delays and decrease the occurrence of secondary incidents, and (4) TOS elements, such as highway advisory radios, extinguishable message signs, changeable message signs and the Bay Area's 511 system, that provide a means of communicating messages quickly to motorists upstream of decision points, allowing them to make informed decisions on the best routes to their destinations. Also, the Regional HOT Network adds HOV/HOT lane miles and makes more efficient use of freeway capacity by varying toll amounts to balance supply and demand.⁴ Tolls during the most congested periods will be comparatively high so only a

⁴ See MTC's *Bay Area HOT Network Study* (December 2008).

small number of solo drivers will buy in while tolls will be much lower during periods of light traffic. Neither of these investments in freeway performance are included in the Heavy Maintenance/Climate Protection alternative or its Land Use and Pricing variations, so vehicle hours of delay are much higher for those alternatives when compared to the proposed Project.

Accessibility to Jobs

Table 3.1-3 shows relative differences in accessibility to jobs amongst the alternatives. Aggressive land use strategies strike a better jobs/housing balance and place more jobs and housing near transit, thus the Heavy Maintenance/Climate Protection Emphasis + Land Use alternative provides for the best overall level of accessibility to jobs by autos and transit. Compared to the proposed Project, the number of jobs accessible by autos under this alternative increases by 11 percent within 15 minutes, 2 percent within 20 minutes and 4 percent within 45 minutes and the number of jobs accessible by transit increases by 44 percent within 15 minutes, 12 percent within 30 minutes and 7 percent within 45 minutes. This improvement in accessibility to job comes without any corresponding increase in roadway and transit supply, illustrating the powerful effects of aggressive land use strategies.

Compared to the proposed Project, the Heavy Maintenance/Climate Protection Emphasis + Pricing alternative provides modest improvement in accessibility to jobs by autos and transit because of the congestion relief characteristics of pricing that benefits auto travel by directing more trips to transit (as discussed above).

Compared to the proposed Project, the No Project alternative and the Heavy Maintenance/Climate Protection Emphasis alternative result in overall fewer jobs accessible by auto and transit for all three time intervals, with slightly fewer jobs accessible by autos and significantly fewer jobs accessible by transit.

Vehicle Miles Traveled (VMT) by Facility Type and Volume to Capacity Ratio (V/C)

As shown in Table 3.1-4, the proposed Project experiences increases in the total regional VMT at LOS F for all facilities between 2006 and 2035 due to the additional travel generated from future population and employment growth (which outpaces the level of investments in improving efficiency and expanding the capacity of the regional transportation system in the proposed Transportation 2035 Plan).

Compared to the proposed Project, all the alternatives would result in higher levels of VMT at LOS F for freeways, primarily due to the absence of the Freeway Performance Initiative in the alternative set of projects, the single most cost-effective program that eliminates freeway congestion.

However, the Heavy Maintenance/Climate Protection Emphasis + Land Use alternative substantially reduces VMT at LOS F for expressways and arterials compared to the proposed Project primarily due to the proximity of people to transit, jobs, and other destinations. The Heavy Maintenance/Climate Protection Emphasis + Pricing alternative modestly reduces VMT at LOS F for expressways and arterials compared to the proposed Project due to the dampening affect of pricing auto travel. Considering all roadways together, the proposed Project performs slightly better than all alternatives.

Vehicle Miles Traveled (VMT) Per Capita

The projected per capita VMT will increase slightly by 4.4 percent (from 20.3 to 21.3) by year 2035 under the proposed Project relative to existing conditions primarily due to the cumulative impact of projected regional growth in population and jobs in the Bay Area. The proposed Project increases transit supply by 18 percent over existing conditions, thereby reducing VMT; while lane miles increase by 6 percent, thereby slightly increasing VMT. The net affect is a slight increase in overall per capita VMT.

Both the Heavy Maintenance/Climate Protection Emphasis + Pricing alternative and the Heavy Maintenance/Climate Protection Emphasis + Land Use alternative result in slightly lower per capita VMT (2.8 percent and 4.2 percent less, respectively, compared to the proposed Project). In general, the amount of VMT and per capita VMT are lower under both alternatives due either to pricing strategies that increase the cost of driving (thereby, reducing auto trips and increasing transit, walk and bike trips) or the land use strategies that call for a more balanced allocation of jobs and housing and placement of jobs and housing near transit (thereby, reducing the length and number of auto trips and increasing transit, walk and bike trips).

Both the No Project alternative and the Heavy Maintenance/Climate Protection Emphasis alternative would increase per capita VMT by 0.5 percent compared to the proposed Project. These alternatives do not increase roadway and transit supply, thereby, providing less accessibility to jobs by transit and transit use in general.

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Table 3.1-1: Roadway Lane Miles and Transit Seat Miles (2006 to 2035)

	2006	2035 Project	2035 No Project	Difference from Proposed Project	Heavy Maintenance/Climate Protection	Difference from Proposed Project	Heavy Maintenance/Climate Protection + Pricing	Difference from Proposed Project	Heavy Maintenance/Climate Protection + Land Use	Difference from Proposed Project
Freeways										
Mixed Flow	4,370	4,530	4,480	-1%	4,480	-1%	4,480	-1%	4,480	-1%
HOV/HOT	380	790	520	-35%	520	-35%	520	-35%	520	-35%
Expressways										
Mixed Flow	910	1,070	1,010	-5%	1,010	-5%	1,010	-5%	1,010	-5%
HOV	50	50	40	-8%	40	-8%	40	-8%	40	-8%
Arterial / Other	14,610	15,000	14,900	-1%	14,900	-1%	14,900	-1%	14,900	-1%
<i>Roadway Lane Miles Total</i>	<i>20,310</i>	<i>21,430</i>	<i>20,950</i>	<i>-2%</i>	<i>20,950</i>	<i>-2%</i>	<i>20,950</i>	<i>-2%</i>	<i>20,950</i>	<i>-2%</i>
Bus Transit	1,262,000	1,325,280	1,295,050	-2%	1,295,000	-2%	1,295,000	-2%	1,295,000	-2%
Light Rail Transit	203,000	225,310	220,190	-2%	220,000	-2%	220,000	-2%	220,000	-2%
Rapid Rail Transit	1,048,000	1,420,250	1,241,120	-13%	1,241,000	-13%	1,241,000	-13%	1,241,000	-13%
Commuter Rail Transit	793,000	835,040	653,450	-22%	653,000	-22%	653,000	-22%	653,000	-22%
Ferry Transit	117,000	217,620	210,870	-3%	211,000	-3%	211,000	-3%	211,000	-3%
<i>Transit Seat Miles Total</i>	<i>3,423,000</i>	<i>4,023,500</i>	<i>3,620,680</i>	<i>-10%</i>	<i>3,621,000</i>	<i>-10%</i>	<i>3,621,000</i>	<i>-10%</i>	<i>3,621,000</i>	<i>-10%</i>

¹AM peak period passenger seat miles per hour

Source: Metropolitan Transportation Commission, 2008

Table 3.1-2: Projected Changes in Travel Behavior

	2006	2035 Project	2035 No Project	Difference from Proposed Project	Heavy Maintenance/Climate Protection	Difference from Proposed Project	Heavy Maintenance/Climate Protection + Pricing	Difference from Proposed Project	Heavy Maintenance/Climate Protection + Land Use	Difference from Proposed Project
<i>Trips by Means of Transportation^a</i>										
Auto	17,611,000	23,267,000	23,331,000	0.3%	23,331,000	0.3%	21,824,000	-6%	23,264,000	0%
Transit	1,106,000	2,007,000	1,938,000	-3%	1,938,000	-3%	2,319,000	16%	2,098,000	5%
Bicycle	377,000	557,000	558,000	0.2%	558,000	0.2%	754,000	35%	598,000	7%
Walk	2,193,000	3,317,000	3,322,000	0.1%	3,322,000	0.1%	4,252,000	28%	3,666,000	11%
Total	21,287,000	29,148,000	29,148,000	0.0%	29,148,000	0.0%	29,148,000	0%	29,626,000	2%
<i>Share of Trips by Means of Transportation</i>										
Auto	83%	80%	80%		80%		75%		80%	
Transit	5%	7%	7%		7%		8%		7%	
Bicycle	2%	2%	2%		2%		3%		2%	
Walk	10%	11%	11%		11%		15%		13%	
Total	100%	100%	100%		100%		100%		102%	
Daily Transit Boardings ^b	1,609,000	3,030,000	2,887,000	-5%	2,887,000	-5%	3,505,000	16%	3,090,000	2%
Daily Vehicle Trips ^c	16,932,000	23,246,000	23,282,000	0.2%	23,282,000	0.2%	22,106,000	-5%	23,123,000	-1%
Daily VMT	144,985,000	191,456,000	192,302,000	0.4%	192,302,000	0.0%	185,971,000	-3%	184,985,000	-3%
Daily VHD	762,000	1,153,000	1,789,000	55%	1,789,000	55%	1,512,000	31%	1,529,000	33%
Avg. Delay/Vehicle (Min)	2.7	3.0	4.6	53%	4.6	53%	4.1	37%	4.0	33%

^aExcludes commercial and interregional trips^bDaily transit boardings includes transfer boardings^cIncludes interregional trips

Source: Metropolitan Transportation Commission, 2008

Table 3.1-3: Accessibility to Jobs (2006 to 2035)

	2006	2035 Project	2035 No Project	Difference from Proposed Project	Heavy Maintenance/ Climate Protection	Difference from Proposed Project	Heavy Maintenance/ Climate Protection + Pricing	Difference from Proposed Project	Heavy Maintenance/ Climate Protection + Land Use	Difference from Proposed Project
Number of Total Jobs Accessible by Auto										
Within 15 minutes	110,000	152,000	150,000	-1%	150,000	-1%	154,000	2%	169,000	11%
Within 30 minutes	454,000	590,000	586,000	-1%	586,000	-1%	607,000	3%	604,000	2%
Within 45 minutes	950,000	1,161,000	1,159,000	-0.1%	1,159,000	-0.1%	1,232,000	6%	1,209,000	4%
Number of Total Jobs Accessible by Transit										
Within 15 minutes	6,000	11,000	9,000	-13%	9,000	-13%	9,000	-12%	15,000	44%
Within 30 minutes	46,000	81,000	73,000	-10%	73,000	-10%	73,000	-10%	90,000	12%
Within 45 minutes	139,000	228,000	213,000	-6%	213,000	-6%	217,000	-5%	244,000	7%

Source: Metropolitan Transportation Commission, 2008

Table 3.1-4: AM Peak Period¹ Regional Vehicle Miles Traveled (VMT) by Facility Type and Volume to Capacity (V/C) Ratio (2006 to 2035)

V/C Ratio	LOS ^b	2006	2035 Project	2035 No Project	Difference from Proposed Project	Heavy Maintenance/Climate Protection	Difference from Proposed Project	Heavy Maintenance/Climate Protection + Pricing	Difference from Proposed Project	Heavy Maintenance/Climate Protection + Land Use	Difference from Proposed Project
Freeways³											
< 0.75	A-C	12,018,000	11,104,000	9,166,000	-17%	9,166,000	-17%	9,583,000	-14%	9,636,000	-13%
0.75 to 1.00	D-E	9,805,000	14,455,000	13,544,000	-6%	13,544,000	-6%	14,425,000	0%	13,799,000	-5%
> 1.00	F	1,360,000	3,106,000	5,506,000	77%	5,506,000	77%	3,624,000	17%	4,060,000	31%
Total		23,183,000	28,664,000	28,217,000	-2%	28,217,000	-2%	27,632,000	-4%	27,495,000	-4%
Expressways and Arterials											
< 0.75	A-C	10,774,000	13,135,000	13,427,000	2%	13,427,000	2%	13,053,000	-1%	13,328,000	1%
0.75 to 1.00	D-E	1,672,000	3,158,000	3,461,000	10%	3,461,000	10%	3,103,000	-2%	3,328,000	5%
> 1.00	F	127,000	598,000	738,000	24%	738,000	24%	583,000	-2%	452,000	-24%
Total		12,573,000	16,891,000	17,626,000	4%	17,626,000	4%	16,739,000	-1%	17,108,000	1%
All Facilities											
< 0.75	A-C	22,792,000	24,239,000	22,593,000	-7%	22,593,000	-7%	22,635,000	-7%	22,964,000	-5%
0.75 to 1.00	D-E	11,477,000	17,613,000	17,005,000	-3%	17,005,000	-3%	17,528,000	0%	17,126,000	-3%
> 1.00	F	1,488,000	3,703,000	6,244,000	69%	6,244,000	69%	4,208,000	14%	4,512,000	22%
Total		35,756,000	45,555,000	45,843,000	1%	45,843,000	1%	44,371,000	-3%	44,603,000	-2%

¹AM peak period is four hours.³Freeways include Freeways and Freeway-to-Freeway connectors. Expressways and Arterials include all other facilities.^bLOS - Level of Service measures traffic density in a range of A to F. LOS A are free-flow conditions with no delay; LOS D-E are more congested conditions with some delay possible; LOS F represents conditions of over-capacity and significant delay.

Source: Metropolitan Transportation Commission, 2008

Table 3.1-5: VMT per Capita

	2006	2035 Project	2035 No Project	Difference from Proposed Project	Heavy Maintenance/ Climate Protection	Difference from Proposed Project	Heavy Maintenance/ Climate Protection + Pricing	Difference from Proposed Project	Heavy Maintenance/ Climate Protection + Land Use	Difference from Proposed Project
VMT per Capita	20.3	21.2	21.3	0.5%	21.3	0.5%	20.6	-2.8%	20.3	-4.2%

Source: Metropolitan Transportation Commission, 2008

AIR QUALITY

Travel Data for Air Quality Analysis

Table 3.1-6 shows the travel data used in this air quality analysis. Compared to the proposed Project, vehicles in use increase by 1 percent each under the No Project alternative and the Heavy Maintenance/Climate Protection Emphasis alternative but decrease by 3 percent each under the Heavy Maintenance/Climate Protection Emphasis + Pricing alternative and Heavy Maintenance/Climate Protection Emphasis + Land Use alternative. The amount of VMT (which is directly correlated to the projected population and job growth) mirrors these trends as well.

Construction-Related Emissions

Construction-related emissions due to the implementation of projects in the proposed Project and alternatives would constitute a direct but short-term impact as projects advance into construction, at different times, over the 25-year horizon. The proposed Project would have higher levels of construction-related emissions due to a larger supply of roadway and transit expansion projects that would be built compared to the alternatives. However, at the regional level, construction-related emissions from all alternatives are considered mitigable to a less than significant level.

Criteria Pollutant Emissions

Table 3.1-7 shows the emissions estimates from criteria pollutants for the proposed Project and alternatives. The level of emissions for criteria pollutants ROG, NO_x, and CO from motor vehicle sources would decrease substantially between 2006 and the 2035 horizon under the proposed Project. This emissions reduction is due to increasingly stringent emission controls CARB has adopted for new vehicle engines and fuels over the past few decades; as a result, the vehicle fleet gets “cleaner” over the next 25 years. However, PM₁₀ and PM_{2.5} emissions from motor vehicle sources increase significantly compared to existing conditions. PM₁₀, which consists primarily of entrained road dust and vehicle emissions, correlates most closely to VMT growth.

Both the Heavy Maintenance/Climate Protection Emphasis + Pricing alternative and the Heavy Maintenance/Climate Protection Emphasis + Land Use alternative decrease the level of emissions for all criteria pollutants relative to the proposed Project. The Heavy Maintenance/Climate Protection + Pricing Emphasis alternative performs the best amongst the alternatives, resulting in roughly 3 percent lower levels of emission for each criteria pollutant compared to the proposed Project. The lower levels of emissions for these two alternatives can be attributed to fewer vehicles in use, lower levels of VMT, and less congested driving which has lower emissions impacts, as well as fewer engine starts because pricing strategies increase the cost of driving (thereby, reducing auto trips and increasing transit, walk and bike trips) and land use strategies balance jobs and housing and direct more jobs and housing developments near transit (thereby, reducing auto trips and increasing transit, walk and bike trips).

Both the No Project alternative and the Heavy Maintenance/Climate Protection Emphasis alternative slightly increase the level of emissions for all criteria pollutants compared to the proposed Project. This is because the proposed Project invests in more transit capacity, thereby reducing vehicle trips.

For PM₁₀ and PM_{2.5} emissions from mobile sources, all alternatives have increased emission levels from existing conditions due to the projected increase in VMT, as vehicle travel disturbs dust on

local roads and freeways and produces more entrained dust. Given regional progress in lowering ground-level ozone (ROG, NO_x) and carbon monoxide levels, differences in alternatives in 2035 are relatively small (less than 3 percent). Regarding particulate matter, the major increases are due to growth in regional travel between now and 2035, and differences between alternatives and the proposed Project are also small (less than 3 percent).

Toxic Air Contaminant (TAC) Emissions

As shown in Table 3.1-8, the levels of TAC emissions significantly decrease under the proposed Project compared to existing conditions mostly because of state laws and regulations aimed at identifying and reducing TACs such as standards for low emission vehicles, clean fuels, reformulated gasoline, diesel fuel specifications and CARB's Heavy Duty Diesel Inspection Programs.

Both the Heavy Maintenance/Climate Protection Emphasis + Pricing alternative and Heavy Maintenance/Climate Protection Emphasis + Land Use alternative slightly decrease the level of TACs emissions compared to the proposed Project (roughly 3 percent decrease). These emission reductions are largely attributable to the progress made at the state-level to address TACs and less so to the investments proposed in the Transportation 2035 Plan or the alternatives.

Both the No Project alternative and the Heavy Maintenance/Climate Protection Emphasis alternative slightly increase the level of TAC emissions compared to the proposed Project (roughly 2 percent increase). This is because the proposed Project invests more in transit capacity, thereby reducing vehicle use.

Chapter 3.1: Alternatives to the Project

Table 3.1-6: Travel Data

	2006	2035 Proposed Project	2035 No Project	Difference from Proposed Project	Heavy Maintenance/ Climate Protection	Difference from Proposed Project	Heavy Maintenance/ Climate Protection + Pricing	Difference from Proposed Project	Heavy Maintenance/ Climate Protection + Land Use	Difference from Proposed Project
Vehicles in Use	4,847,000	6,694,000	6,729,000	1%	6,729,000	1%	6,497,000	-3%	6,509,000	-3%
Daily VMT, Adjusted	159,232,000	209,785,000	210,880,000	1%	210,880,000	1%	203,667,000	-3%	203,870,000	-3%
Engine Starts	32,413,000	43,912,000	44,144,000	1%	44,144,000	1%	42,627,000	-3%	42,701,000	-3%
Total Population	7,159,000	9,031,000								
Total Employment	3,499,000	5,248,000								

Source: Metropolitan Transportation Commission, 2008; Association of Bay Area Governments, Projections 2007

Table 3.1-7: Emission Estimates for Criteria Pollutants using EMFAC2007 Factors (tons per day)

	2006	2035 Proposed Project	2035 No Project	Difference from Proposed Project	Heavy Maintenance/ Climate Protection	Difference from Proposed Project	Heavy Maintenance/ Climate Protection + Pricing	Difference from Proposed Project	Heavy Maintenance/ Climate Protection + Land Use	Difference from Proposed Project
ROG	131.1	37.2	37.5	0.7%	37.5	0.7%	36.1	-3.0%	36.2	-2.7%
NO _x	209.8	42.8	43.2	0.8%	43.2	0.8%	41.6	-2.9%	41.7	-2.7%
CO	1,235.4	268.7	272.3	1.3%	272.3	1.3%	261.5	-2.7%	262.7	-2.2%
PM ₁₀	65.7	84.1	84.7	0.7%	84.7	0.7%	81.7	-2.9%	81.8	-2.7%
PM _{2.5}	17.2	20.4	20.7	1.2%	20.7	1.2%	19.9	-2.8%	19.9	-2.4%

Source: Metropolitan Transportation Commission, 2008

Table 3.1-8: Emission Estimates for Mobile Source Air Toxic (MSAT) Pollutants (kilograms per day)

	2006	2035 Proposed Project	2035 No Project	Difference from Proposed Project	Heavy Maintenance/ Climate Protection	Difference from Proposed Project	Heavy Maintenance/ Climate Protection + Pricing	Difference from Proposed Project	Heavy Maintenance/ Climate Protection + Land Use	Difference from Proposed Project
Diesel PM	3,073	716	728	1.6%	728	1.6%	697	-2.7%	698	-2.6%
1,3 Butadiene	241	53	53	0.3%	53	0.3%	51	-3.8%	51	-3.5%
Benzene	1,284	311	316	1.7%	316	1.7%	301	-3.1%	310	-0.2%

Source: Metropolitan Transportation Commission, 2008

LAND USE AND HOUSING

Farmland

According to the GIS analysis methodology described in Chapter 2.3, each alternative has less of a potential impact on farmland than the proposed Project because the alternatives include fewer physical transportation improvements than the proposed Project.

- The No Project alternative could potentially affect about 260 acres of farmland through 31 projects in seven counties. Fourteen of the 31 are widening projects. Contra Costa County would be the most impacted under this alternative.
- The Heavy Maintenance/Climate Protection Emphasis alternative could potentially affect about 300 acres of farmland through 33 projects in all eight counties with farmland (San Francisco County has no farmland). Fourteen of the 33 are widening projects. Both Contra Costa and Santa Clara Counties would be the most impacted under this alternative.
- The Heavy Maintenance/Climate Protection Emphasis alternative variations with Land Use and Pricing Strategies have the potential to affect approximately the same amount of farmland as the basic Heavy Maintenance/Climate Protect Emphasis alternative, when considering strictly the program of physical improvements. However, considering the potential cumulative impact of land use regulations for development around transportation infrastructure, it is reasonable to suppose that the Heavy Maintenance/Climate Protection Emphasis + Land Use alternative that increases density and directs growth toward transit might also reduce its cumulative farmland impacts relative to all other alternatives.

Table 3.1-9: Type and Amount of Farmland Potentially Affected by 2035 Alternatives (Acres)

Type	2035 Proposed Project	No Project	% Diff.	Heavy Maint/ Climate Protection	% Diff.	Heavy Maint/ Climate Protection + Pricing	% Diff.	Heavy Maint/ Climate Protection + Land Use	% Diff.
Prime	290	56	-81%	56	-81%	56	-81%	56	-81%
Statewide Importance	44	31	-30%	31	-30%	31	-30%	31	-30%
Local Importance	237	37	-84%	37	-84%	37	-84%	37	-84%
Grazing	802	135	-83%	168	-79%	168	-79%	168	-79%
Unique	24	4	-83%	4	-83%	4	-83%	4	-83%
Total Farmland	1,397	263	-81%	295	-79%	295	-79%	295	-79%

Note: The Heavy Maintenance/Climate Protection Emphasis alternative would impact slightly more grazing land than the No Project alternative, but the calculated difference is minimal and due primarily to GIS portrayal of road widening and intersection realignments.

Source: Dyett & Bhatia, 2008

Long Term Urban Land Use Divisions/Displacement

Each alternative has less potential to divide or displace existing urban land uses than the proposed Project (as shown in Table 3.1-10) primarily because the alternatives include fewer physical transportation improvements (notably expansions and extensions) than the proposed

Project. In the proposed Project and all alternatives, employment areas would be relatively more affected by land use displacement than residential areas and urban open space, because the land adjacent to major roads is generally more likely to be non-residential than residential, so changes to those roads affect employment uses first.

- The No Project alternative would impact significantly fewer existing land uses than the proposed Project – only about 200 acres in seven counties. Sixty percent of the potential impacts will occur in employment areas, with the rest occurring equally in residential and open space areas.
- The Heavy Maintenance/Climate Protection Emphasis alternative would impact significantly fewer existing land uses than the proposed Project – about 300 acres in eight counties. Most of those impacts will occur in employment and residential areas.
- The Heavy Maintenance/Climate Protection Emphasis alternative variations with Land Use and Pricing Strategies have the potential to affect approximately the same amount of existing urban land uses as the basic Heavy Maintenance/Climate Protect Emphasis alternative, when considering strictly the program of physical improvements. However, considering the potential cumulative impact of land use regulations for development around transportation infrastructure, it is reasonable to suppose that the Heavy Maintenance/Climate Protection + Land Use alternative that increases density and directs regional growth toward transit might also increase cumulative urban land disruption relative to other alternatives due to increased infill in urban areas where there are more existing land uses to disturb.

Table 3.1-10: Community Land Use Acres Potentially Affected by 2035 Alternatives

Land Use	Proposed Project	No Project	Heavy Maintenance/ Climate Protection	Heavy Maintenance/ Climate Protection + Pricing	Heavy Maintenance/ Climate Protection + Land Use
Employment Areas	920	123	137	137	137
Residential	701	40	115	115	115
Urban Open Space	533	42	53	53	53
Total	2,154	205	304	304	304

Note: the Heavy Maintenance/Climate Protection Emphasis alternative has somewhat more potential to disrupt or displace existing urban land uses than the No Project alternative, but the calculated difference is minimal and is mostly due to GIS portrayal of road widening and intersection realignments.

Source: Dyett & Bhatia, 2008

Short-Term Community Disruption

Compared to the proposed Project, each of the alternatives involves substantially less new construction activity. The major investments within the alternatives relate to improving capacity through maintenance of current roadways rather than creating new capacity through new roadway projects. Nonetheless, even in the alternatives there is a potential for intermittent disruption of normal activities in adjacent neighborhoods and communities since some of alternatives include road realignment, repaving, or widening.

- The No Project alternative may result in some short-term community disruption, as it assumes construction of projects with currently committed funding. The impacts may include noise, dust, traffic delays, loss of vegetation due to earth moving, and other

temporary impacts due to construction work. However, it would still likely have fewer short-term disruption impacts than the proposed Project.

- The Heavy Maintenance/Climate Protection Emphasis alternative could have slightly more construction-related short-term impact than the No Project alternative due to a few additional projects in the network that involve road widening and intersection realignment. However, it would still likely have fewer short-term disruption impacts than the proposed Project.
- The Heavy Maintenance/Climate Protection Emphasis + Pricing alternative would have a similar level of construction-related impacts as the Heavy Maintenance/Climate Protection Emphasis alternative in noise, dust, loss of vegetation, and other short term environmental impacts. The negative impact on local traffic, however, may be relatively lower. Combating increased traffic on some lanes due to road closure for construction work, traffic may be reduced due to the implementation of pricing strategies. People may carpool, or try to avoid rush-hour traffic in response to the increased cost of driving. This alternative would likely have fewer short-term impacts than the proposed Project.
- The Heavy Maintenance/Climate Protection Emphasis + Land Use alternative would have a similar level of construction-related impacts as the Heavy Maintenance alternative in noise, dust, traffic delays, loss of vegetation, and other short term environmental impacts. From the cumulative perspective, it is possible that increased urban infill development may result in slightly more short-term disruption of existing communities compared to the other alternatives, due to slightly more local construction efforts beyond the transportation improvements themselves. This alternative would likely have fewer short-term impacts than the proposed Project.

In conclusion, the No Project alternative would likely cause the least amount of long-term physical disruption in both farmland and urban land uses, primarily because it provides for the fewest physical improvements. The Heavy Maintenance/Climate Protection Emphasis + Land Use alternative would rank second best when looking at farmland impacts, but it also has more potential to disrupt existing communities through cumulative indirect effects of a land use regulatory structure that encourages redevelopment of downtowns and transit areas.

Consistency with Local Plans

As projects are evaluated at the local level before they are proposed to MTC for inclusion in the RTP, it is reasonable to assume that component projects are consistent with applicable local general plans and transportation plans. The Heavy Maintenance/Climate Protection Emphasis + Land Use alternative, however, uses a different underlying land use forecast than the proposed Project and the rest of the other alternatives. This alternative forecast assumes a different distribution of population and employment growth such that higher densities are achieved in the region's existing cities as compared to *Projections 2007*. Thus, this forecast is likely different than what is currently contained in local general plans. In other words, the overall population and employment growth projected for the region as a whole is the same as *Projections 2007*, but that growth would take place with less expansion of urban land. Table 3.1-11 shows the difference in acres by regional land use projection (please note: ABAG's *Projections 2007* is used in the proposed Project, the No Project, the Heavy Maintenance/Climate Protection Emphasis alternative, and the Heavy Maintenance/Climate Protection Emphasis + Pricing alternative; they are not provided separate columns in this table because these projections do not differ at all across transportation networks).

By way of example, the combined residential, commercial, and industrial land use acreages for Alameda County show 4,024 fewer urban acres if the Heavy Maintenance/Climate Protection Emphasis + Land Use alternative is adopted compared to all other alternatives (the proposed Project, the No Project, the Heavy Maintenance/Climate Protection Emphasis alternative and the Heavy Maintenance/Climate Protection Emphasis + Pricing alternative) which are assumed to be consistent with *Projections 2007*. This simply shows that more people and economic activity would be expected on existing developed land under those alternative projections. Therefore, adopting the Heavy Maintenance/Climate Protection Emphasis + Land Use alternative could introduce more inconsistencies with local plans. These inconsistencies, though, would gradually fade if local jurisdictions update their land use policies over time to accommodate the regional planning efforts of MTC and its partner agencies.

Table 3.1-11: Regional Projections Comparison, Residential/Commercial/Industrial Acres

County	Existing Conditions (2006)	All 2035 Alternatives Using ABAG Projections 2007	2035 Heavy Maintenance/Climate Protection + Land Use	% Change, 2006 to 2035 for All Alternatives Using ABAG Projections 2007	% Difference, Land Use Alternative Projection Compared to ABAG Projections 2007
Alameda	138,308	154,564	150,540	11.8%	-2.6%
Contra Costa	120,961	142,717	130,601	18.0%	-8.5%
Marin	39,671	42,453	43,512	7.0%	2.5%
Napa	23,959	26,596	26,421	11.0%	-0.7%
San Francisco	15,401	15,887	15,905	3.2%	0.1%
San Mateo	85,770	90,198	90,000	5.2%	-0.2%
Santa Clara	165,350	177,928	178,282	7.6%	0.2%
Solano	71,098	83,330	76,933	17.2%	-7.7%
Sonoma	179,610	192,636	191,206	7.3%	-0.7%
Bay Area	840,128	926,309	903,400	10.3%	-2.5%

Source: Metropolitan Transportation Commission Data Summary, 2007

ENERGY

The Heavy Maintenance/Climate Protection Emphasis + Pricing alternative would result in the lowest consumption of energy for transportation and the greatest reduction in transportation energy use from baseline conditions (see Table 3.1-12). This is primarily due to reduced congestion which results in increased fuel efficiency of vehicles. Transportation energy consumption for the Heavy Maintenance/Climate Protection Emphasis + Land Use alternative would be less than 1 percent greater than that of the Heavy Maintenance/Climate Protection + Pricing alternative, representing the reduction in VMT associated with proximity of housing, jobs, and other land uses, but slightly less fuel efficiency than that which results from pricing strategies. The proposed Project would result in transportation energy use about 3 percent greater than the Heavy Maintenance/Climate Protection + Pricing alternative, but would still use nearly 28 percent less transportation energy than baseline conditions.

The No Project alternative and the Heavy Maintenance/Climate Protection Emphasis basic alternative would both result in greater consumption of transportation energy than either the proposed Project or the Heavy Maintenance/Climate Protection Emphasis alternative Land Use and Pricing variations, but still 27 percent less than under baseline conditions, due to more efficient on-road vehicles that are assumed by 2035 as a result of the state's Pavley rules regarding vehicle emissions (see also CO₂ discussion), which would more than offset increased vehicle miles traveled under all future conditions.

Table 3.1-12: Daily Direct and Indirect Energy Consumption Comparison (Billions of BTUs)

	2006	Proposed Project	No Project	Heavy Maintenance/Climate Protection	Heavy Maintenance/Climate Protection + Land Use	Heavy Maintenance/Climate Protection + Pricing
On-Road Vehicles	1,150.6	971.0	989.8	989.8	952.4	943.7
Transit Vehicles	27.5	39.3	37.2	37.2	39.0	39.0
Direct Energy Total	1,178.2	1,010.2	1,027.0	1,027.0	991.5	982.7
Manufacturing and Maintenance	249.1	321.7	322.7	322.7	312.8	312.5
Construction	—	21.8	10.6	10.6	18.4	18.4
Indirect Energy Total	249.1	346.6	333.3	333.3	331.2	330.9
Total Daily Energy	1,427.8	1,353.8	1,360.3	1,360.3	1,322.7	1,313.7
Percent Change from Baseline	—	(5.1%)	(4.7%)	(4.7%)	(7.3%)	(8.0%)
Percent Change from No Project	—	(0.5%)	—	—	(2.8%)	(3.4%)
Percent Change from Project	—	—	0.5%	0.5%	(2.3%)	(3.0%)
Per Capita Daily Energy (BTU)	199,358	149,906	150,627	150,627	146,463	145,464
Percent Change from Baseline	—	(24.8%)	(24.4%)	(24.4%)	(26.5%)	(27.0%)
Percent Change from No Project	—	(0.5%)	—	—	(2.8%)	(3.4%)
Percent Change from Project	—	—	0.5%	0.5%	(2.3%)	(3.0%)

BTU: British Thermal Unit

Source: Environmental Science Associates, 2008; Metropolitan Transportation Commission Model Outputs, 2008

CLIMATE CHANGE AND GREENHOUSE GASES

Carbon Dioxide Emissions

Overall, the implementation of AB 1493 (Pavley) is the primary reason why CO₂ emissions decline from existing conditions to 2035 for all alternatives.

As shown in Table 3.1-13, a comparison of the alternatives to the proposed Project concludes that the Heavy Maintenance/Climate Protection Emphasis + Pricing alternative is estimated to produce the lowest levels of daily carbon dioxide emissions, followed by the Heavy Maintenance/Climate Protection Emphasis + Land Use alternative, both of which perform better than the proposed Project. The relative improved performance of the Heavy Maintenance/Climate Protection Emphasis + Pricing alternative is a result of the pressure of high driving cost reducing VMT overall, as well as the pressures of high driving cost reducing congestion in particular parts of the transportation system. The result of the modeling suggests that pricing is particularly effective at changing driving activity. The relative improvement of the Heavy Maintenance/Climate Protection + Land Use alternative is a result of increased non-auto mode share due to proximity of homes to jobs and essential services. This result suggests that land use also plays a substantive role in changing driving behaviors.

Notably, the No Project and Heavy Maintenance/Climate Protection Emphasis alternatives do not display improvement from the proposed Project. This is because:

- The No Project and Heavy Maintenance/Climate Protection alternatives share a “no expansion” strategy. The transit and roadway supplies are lower under both alternatives compared to the proposed Project. The smaller network makes it more difficult for these alternatives to meet the needs of future regional growth and travel demand and results instead in greater congestion and delay;
- Investments like the Freeway Performance Initiative and Regional HOT Network that are effective on reducing vehicle delay, particularly on freeways, are excluded under both alternatives; and
- Without additional land use or pricing influences, the reduced transportation network has both more congestion and fewer incentives/opportunities to switch from autos to transit, bicycle, and pedestrian modes.

Thus, while the Heavy Maintenance/Climate Protection Emphasis alternative was designed to channel funding toward the existing system, including reducing transit operating shortfalls and supporting walking and biking programs and infrastructure, the modeling suggests that these infrastructure choices alone are not enough to substantially change driving behaviors and thus greenhouse gas emissions. Rather, other approaches such as pricing and land use change must be used in conjunction with infrastructure to make a large reduction in VMT and congestion.

Table 3.1-13: CO₂ Emissions

	2006	2035 Project	2035 No Project	Difference from Proposed Project	Heavy Maintenance/ Climate Protection Emphasis	Difference from Proposed Project	Heavy Maintenance/ Climate Protection Emphasis + Pricing	Difference from Proposed Project	Heavy Maintenance/ Climate Protection Emphasis + Land Use	Difference from Proposed Project
CO2 Emissions with Pavley I and II	89.6	75.6	77.1	1.9%	77.1	1.9%	73.5	-2.8%	74.2	-1.9%
CO2 Emissions with <i>only</i> Pavley I	89.6	83.9	85.6	2.0%	85.6	2.0%	81.6	-2.8%	80.1	-4.6%
CO2 Emissions <i>without</i> Pavley	89.6	113.6	116.0	2.1%	116.0	2.1%	110.5	-2.7%	111.6	-1.8%
CO2 Equivalent Emissions with Pavley I and II	91.4	77.1	78.6	1.9%	78.6	1.9%	74.9	-2.8%	75.6	-1.9%
CO2 Equivalent Emissions with <i>only</i> Pavley I	91.4	85.6	87.3	2.0%	87.3	2.0%	83.2	-2.8%	81.7	-4.6%
CO2 Equivalent Emissions <i>without</i> Pavley I or II	91.4	115.9	118.3	2.1%	118.3	2.1%	112.7	-2.7%	113.8	-1.8%

Source: Metropolitan Transportation Commission, 2008

Sea Level Rise

Sea level rise that could occur as a result of global climate change is likely to have widespread effects on coastal structures, infrastructure, beaches, wetlands, and agricultural lands. Many of the region's most significant transportation corridors and sites are located along the San Francisco Bay shoreline and, as a result, are already vulnerable to projected sea level rise and storm surge. Future investment in transportation improvements—particularly new infrastructure or increased capacity—along these same corridors is likely to increase overall system vulnerability to sea level rise and storm surge. The contributing factors to the cumulative impact are true for all alternatives. At the same time, the mitigation measures which include planning for infrastructure protection, investments in vulnerability analysis, and exploring the potential for important realignments, also apply to all alternatives.

It seems reasonable to expect that the proposed Project, with the largest amount of new physical construction, would contribute the largest increase in vulnerability to the cumulative effect relative to the other alternatives. On the other hand, it is also reasonable to expect that the Heavy Maintenance/Climate Protection Emphasis + Land Use alternative, with its adjusted development projections moving population even farther in toward urban areas along the coast and Bay margins, would by nature increase vulnerability of communities and infrastructure to sea level rise in comparison to alternatives based on *Projections 2007*. Furthermore, the alternative with the best transportation functionality (e.g. lowest congestion, fastest average speeds, and most connectivity) might prove to be the least vulnerable because it can best handle localized storm surge inundation by redistributing traffic among other parts of the system. In that case, the proposed Project or the Heavy Maintenance/Climate Protection Emphasis + Pricing variation would be preferred alternatives to reduce vulnerability to sea level rise. Considering each of these factors, the least preferable would seem to be the No Project alternative because it suffers from the same cumulative vulnerability due to population growth while contributing little to no new investment in climate protection programs, critical retrofits and renovations, or system functionality improvements.

In summary, the environmentally preferable alternative for GHG emissions could be either Heavy Maintenance/Climate Protection Emphasis + Land Use alternative or the Heavy Maintenance/Climate Protection + Pricing alternative. The other alternatives seem to perform somewhat less well than the proposed Project. In terms of sea level rise, the environmentally preferable alternative would likely be the Heavy Maintenance/Climate Protection Emphasis + Pricing alternative. All other alternatives seem to perform somewhat less well than the proposed Project.

NOISE

As shown in Table 3.1-14, each of the alternatives would result in an increase in the overall percentage of regional roadway miles exposed to noise levels at or above 66 dBA, compared to baseline (2006) conditions. The smallest increase in roadway miles exposed 66 dBA or greater noise levels would occur under the proposed Project (7.5 percent), while the No Project alternative and Heavy Maintenance/Climate Protection Emphasis alternative would result in a 9.4 percent increase, and the Heavy Maintenance/Climate Protection Emphasis + Pricing alternative and Heavy Maintenance/Climate Protection + Land Use alternative would result in increases of 8.3 percent and 8.2 percent, respectively. Thus, on a regional basis, the proposed Project would result in the least severe increase in 66 dBA or greater noise levels. Similar relationships between alternatives would prevail at the county level, although there would be some exceptions: for example, the Heavy Maintenance/Climate Protection Emphasis + Land Use and Pricing alternatives would result in fewer miles exposed to 66 dBA or greater on Santa Clara County expressways than the proposed Project, the No Project, or the Heavy Maintenance/Climate Protection Emphasis basic alternative, while Napa County arterials would fare best with the Heavy Maintenance/Climate Protection Emphasis + Pricing alternative and worst with the proposed Project. In terms of roadway miles that would experience a significant increase (3 dBA or more) in noise levels compared to baseline conditions, the proposed Project would likewise result in the smallest increase on a regional basis, followed by the Heavy Maintenance/Climate Protection Emphasis + Land Use and Pricing alternatives.

The No Project alternative and the Heavy Maintenance/Climate Protection Emphasis alternative would see the greatest increase in roadway miles that would experience a 3 dBA or more increase in noise (see Table 3.1-15). As in the prior table's comparison, the same relationships would hold, for the most part, on a county-by-county basis. As with the proposed Project, noise effects of each alternative, while potentially significant, would be able to be mitigated to a less-than-significant level with mitigation measures identified in Chapter 2, with the exception of effects due to cumulative increases in traffic noise due to each alternative and the effects of growth due to implementation of other regional and local land use policies and plans. This latter, cumulative impact would be significant and unavoidable for each of the alternatives, as it would for the proposed Project. Also as with the proposed Project, construction noise effects would be expected to be less than significant, and would be incrementally less severe under each of the alternatives, compared to conditions with the proposed Project, because fewer construction projects would be undertaken.

Part Three: Alternative and CEQA-Required Conclusions

Chapter 3.1: Alternatives to the Project

Table 3.1-14: Roadway Directional Miles > 66 dBA NAC Level, and Total Directional Miles, by Roadway Type and County

County	Roadway Type	Year 2006, Base Year			Year 2035, Project			Year 2035, No Project			Diff. from Project		Hvy. Maint./Climate Protect			Diff. from Project	
		# over 66 dBA	Total	% over 66 dBA	# over 66 dBA	Total	% over 66 dBA	# over 66 dBA	Total	% over 66 dBA	# over 66 dBA	% over 66 dBA	# over 66 dBA	Total	% over 66 dBA	# over 66 dBA	% over 66 dBA
San Francisco	Freeways	53	53	100.0%	55	55	100.0%	53	53	100.0%	-2	0.0%	53	53	100.0%	-2	0.0%
	Expressways	2	2	100.0%	2	2	100.0%	2	2	100.0%	0	0.0%	2	2	100.0%	0	0.0%
	Arterials	183	633	28.9%	228	633	36.0%	236	635	37.2%	8	1.2%	236	635	37.2%	8	1.2%
San Mateo	Freeways	167	170	98.5%	168	170	99.0%	168	170	99.2%	0	0.3%	168	170	99.2%	0	0.3%
	Expressways	29	31	92.0%	29	31	92.8%	29	31	92.8%	0	0.0%	29	31	92.8%	0	0.0%
	Arterials	276	1,068	25.8%	360	1,070	33.6%	371	1,068	34.7%	11	1.1%	371	1,068	34.7%	11	1.1%
Santa Clara	Freeways	325	328	99.2%	323	326	99.2%	324	326	99.4%	1	0.2%	324	326	99.4%	1	0.2%
	Expressways	190	233	81.8%	224	235	95.4%	217	235	92.5%	-7	-2.9%	217	235	92.5%	-7	-2.9%
	Arterials	665	2,066	32.2%	877	2,083	42.1%	921	2,077	44.3%	44	2.2%	921	2,077	44.3%	44	2.2%
Alameda	Freeways	304	304	100.0%	305	305	100.0%	305	305	100.0%	0	0.0%	305	305	100.0%	0	0.0%
	Expressways	34	40	84.1%	41	45	91.2%	36	40	90.7%	-4	-0.5%	36	40	90.7%	-4	-0.5%
	Arterials	618	1,805	34.2%	791	1,830	43.2%	826	1,829	45.2%	35	1.9%	826	1,829	45.2%	35	1.9%
Contra Costa	Freeways	184	184	99.8%	184	184	99.8%	184	184	99.8%	0	0.0%	184	184	99.8%	0	0.0%
	Expressways	18	27	65.1%	32	52	61.8%	36	50	72.2%	4	10.4%	36	50	72.2%	4	10.4%
	Arterials	467	1,548	30.2%	659	1,606	41.0%	688	1,598	43.1%	29	2.0%	688	1,598	43.1%	29	2.0%
Solano	Freeways	172	174	99.0%	172	174	99.0%	172	174	99.0%	0	0.0%	172	174	99.0%	0	0.0%
	Expressways	49	60	82.5%	52	72	72.3%	52	64	82.0%	0	9.7%	52	64	82.0%	0	9.7%
	Arterials	167	734	22.7%	250	741	33.8%	268	734	36.5%	17	2.7%	268	734	36.5%	17	2.7%
Napa	Freeways	24	24	100.0%	24	24	100.0%	24	24	100.0%	0	0.0%	24	24	100.0%	0	0.0%
	Expressways	37	37	100.0%	37	37	100.0%	37	37	100.0%	0	0.0%	37	37	100.0%	0	0.0%
	Arterials	81	484	16.7%	111	489	22.8%	109	484	22.5%	-2	-0.2%	109	484	22.5%	-2	-0.2%
Sonoma	Freeways	132	132	100.0%	132	132	100.0%	132	132	100.0%	0	0.0%	132	132	100.0%	0	0.0%
	Expressways	20	20	100.0%	20	20	100.0%	20	20	100.0%	0	0.0%	20	20	100.0%	0	0.0%
	Arterials	351	1,153	30.4%	433	1,167	37.1%	492	1,160	42.4%	59	5.3%	492	1,160	42.4%	59	5.3%
Marin	Freeways	77	77	100.0%	77	77	100.0%	77	77	100.0%	0	0.0%	77	77	100.0%	0	0.0%
	Arterials	110	559	19.7%	124	559	22.1%	135	559	24.1%	11	2.0%	135	559	24.1%	11	2.0%
Bay Area	Freeways	1,438	1,445	99.5%	1,440	1,446	99.6%	1,439	1,444	99.6%	-1	0.1%	1,439	1,444	99.6%	-1	0.1%
	Expressways	379	450	84.2%	437	494	88.5%	430	479	89.8%	-7	1.3%	430	479	89.8%	-7	1.3%
	Arterials	2,918	10,050	29.0%	3,834	10,179	37.7%	4,047	10,144	39.9%	213	2.2%	4,047	10,144	39.9%	213	2.2%
	Combined	4,735	11,945	39.6%	5,711	12,119	47.1%	5,916	12,067	49.0%	205	1.9%	5,916	12,067	49.0%	205	1.9%

Chapter 3.1: Alternatives to the Project

Table 3.1-14 (cont'd.): Roadway Directional Miles > 66 dBA NAC Level, and Total Directional Miles, by Roadway Type and County

County	Roadway Type	Hvy. Maint./CP + Land Use			Diff. from Project		Hvy. Maint./CP + Pricing			Diff. from Project	
		# over 66 dBA	Total	% over 66 dBA	# over 66 dBA	% over 66 dBA	# over 66 dBA	Total	% over 66 dBA	# over 66 dBA	% over 66 dBA
San Francisco	Freeways	53	53	100.0%	-2	0.0%	53	53	100.0%	-2	0.0%
	Expressways	2	2	100.0%	0	0.0%	2	2	100.0%	0	0.0%
	Arterials	230	635	36.3%	2	0.3%	218	635	34.3%	-10	-1.7%
San Mateo	Freeways	168	170	99.0%	0	0.1%	168	170	99.0%	0	0.0%
	Expressways	31	31	98.4%	2	5.7%	29	31	92.8%	0	0.0%
	Arterials	380	1,068	35.5%	20	2.0%	356	1,068	33.3%	-4	-0.3%
Santa Clara	Freeways	324	326	99.5%	1	0.3%	324	326	99.4%	1	0.2%
	Expressways	213	235	90.5%	-12	-4.9%	215	235	91.4%	-10	-4.1%
	Arterials	908	2,077	43.7%	30	1.6%	894	2,077	43.0%	17	0.9%
Alameda	Freeways	305	305	100.0%	0	0.0%	305	305	100.0%	0	0.0%
	Expressways	37	40	92.5%	-3	1.3%	36	40	90.7%	-4	-0.5%
	Arterials	836	1,829	45.7%	45	2.5%	803	1,829	43.9%	12	0.7%
Contra Costa	Freeways	184	184	99.8%	0	0.0%	184	184	99.8%	0	0.0%
	Expressways	31	50	61.1%	-1	-0.7%	36	50	72.2%	4	10.4%
	Arterials	631	1,598	39.5%	-28	-1.6%	658	1,598	41.2%	-1	0.2%
Solano	Freeways	173	174	99.5%	1	0.5%	172	174	99.0%	0	0.0%
	Expressways	46	64	72.4%	-6	0.1%	52	64	82.0%	0	9.7%
	Arterials	212	734	28.9%	-38	-4.9%	263	734	35.9%	13	2.1%
Napa	Freeways	24	24	100.0%	0	0.0%	24	24	100.0%	0	0.0%
	Expressways	37	37	100.0%	0	0.0%	37	37	100.0%	0	0.0%
	Arterials	110	484	22.7%	-2	-0.1%	108	484	22.2%	-4	-0.5%
Sonoma	Freeways	132	132	100.0%	0	0.0%	132	132	100.0%	0	0.0%
	Expressways	20	20	100.0%	0	0.0%	20	20	100.0%	0	0.0%
	Arterials	460	1,160	39.7%	27	2.5%	477	1,160	41.1%	43	4.0%
Marin	Freeways	77	77	100.0%	0	0.0%	77	77	100.0%	0	0.0%
	Arterials	167	559	29.8%	43	7.7%	124	559	22.2%	0	0.1%
Bay Area	Freeways	1,439	1,444	99.7%	0	0.1%	1,438	1,444	99.6%	-2	0.1%
	Expressways	417	479	86.9%	-21	-1.6%	428	479	89.2%	-9	0.7%
	Arterials	3,933	10,144	38.8%	99	1.1%	3,901	10,144	38.5%	67	0.8%
	Combined	5,789	12,067	48.0%	78	0.9%	5,767	12,067	47.8%	56	0.7%

Source: Environmental Science Associates 2008; Metropolitan Transportation Commission Model Outputs 2008

Table 3.1-15 Roadway Directional Miles with Significant Increase in Noise Levels (> 3 dBA), Alternatives Comparison

County	Roadway Type	Year 2035, Project			Year 2035, No Project			Year 2035, Heavy Maintenance/CP			Year 2035, Heavy Maintenance/CP + Land Use			Year 2035, Heavy Maintenance/CP + Pricing		
		> 3 dBA Increase	Total	% with >3 dBA increase	> 3 dBA Increase	Total	% with >3 dBA increase	> 3 dBA Increase	Total	% with > 3 dBA increase	> 3 dBA Increase	Total	% with > 3 dBA increase	> 3 dBA Increase	Total	% with >3 dBA increase
San Francisco	Freeways	5	55	8.30%	3	53	6.00%	3	53	6.00%	4	53	7.00%	2	53	2.90%
	Expressways	0	2	0.00%	0.4	2	28.30%	0.4	2	28.30%	0	2	0.00%	0	2	0.00%
	Arterials	70	631	11.10%	81	633	12.90%	81	633	12.90%	101	633	16.00%	53	633	8.30%
San Mateo	Freeways	0.3	168	0.20%	0.4	168	0.20%	0.4	168	0.20%	0	168	0.00%	0	168	0.00%
	Expressways	1	31	4.60%	4	31	11.80%	4	31	11.80%	2	31	5.40%	1	31	1.60%
	Arterials	177	1,063	16.70%	225	1,063	21.20%	225	1,063	21.20%	218	1,063	20.50%	179	1,063	16.80%
Santa Clara	Freeways	2	326	0.70%	2	326	0.70%	2	326	0.70%	2	326	0.70%	2	326	0.70%
	Expressways	100	234	42.70%	36	234	15.60%	36	234	15.60%	38	234	16.30%	28	234	11.90%
	Arterials	345	2,059	16.70%	462	2,058	22.50%	462	2,058	22.50%	376	2,058	18.30%	370	2,058	18.00%
Alameda	Freeways	2	305	0.70%	2	305	0.70%	2	305	0.70%	2	305	0.70%	2	305	0.70%
	Expressways	3	39	7.40%	10	39	24.90%	10	39	24.90%	11	39	29.00%	7	39	17.40%
	Arterials	270	1,801	15.00%	380	1,801	21.10%	380	1,801	21.10%	425	1,801	23.60%	300	1,801	16.70%
Contra Costa	Freeways	8	182	4.40%	3	182	1.70%	3	182	1.70%	4	182	2.30%	3	182	1.90%
	Expressways	5	27	17.10%	5	27	17.10%	5	27	17.10%	0.2	27	0.80%	3	27	12.10%
	Arterials	272	1,525	17.80%	315	1,526	20.70%	315	1,526	20.70%	254	1,526	16.60%	262	1,526	17.20%
Solano	Freeways	3	174	1.60%	2	174	1.00%	2	174	1.00%	1	174	0.70%	2	174	1.00%
	Expressways	4	62	6.60%	10	62	16.70%	10	62	16.70%	6	62	10.50%	10	62	16.70%
	Arterials	80	732	11.00%	119	732	16.30%	119	732	16.30%	79	732	10.80%	111	732	15.10%
Napa	Freeways	0	24	0.00%	0	24	0.00%	0	24	0.00%	0	24	0.00%	0	24	0.00%
	Expressways	0	31	0.00%	0	31	0.00%	0	31	0.00%	3	31	11.00%	0	31	0.00%
	Arterials	69	484	14.20%	135	484	27.90%	135	484	27.90%	102	484	21.10%	103	484	21.30%
Sonoma	Freeways	0.5	132	0.40%	0.5	132	0.40%	0.5	132	0.40%	0.5	132	0.40%	0.5	132	0.40%
	Expressways	0	20	0.00%	0	20	0.00%	0	20	0.00%	0	20	0.00%	0	20	0.00%
	Arterials	151	1,153	13.10%	219	1,153	19.00%	219	1,153	19.00%	144	1,153	12.50%	206	1,153	17.80%
Marin	Freeways	1	77	0.90%	0.3	77	0.40%	0.3	77	0.40%	0.3	77	0.40%	0.3	77	0.40%
	Arterials	30	559	5.40%	110	559	19.60%	110	559	19.60%	172	559	30.80%	84	559	15.00%
Bay Area	Freeways	21	1,441	1.50%	14	1,439	0.90%	14	1,439	0.90%	14	1,439	1.00%	12	1,439	0.80%
	Expressways	113	447	25.40%	65	447	14.60%	65	447	14.60%	62	447	13.80%	49	447	10.90%
	Arterials	1,463	10,007	14.60%	2,047	10,008	20.50%	2,047	10,008	20.50%	1,872	10,008	18.70%	1,666	10,008	16.60%
	Combined	1,597	11,895	13.40%	2,126	11,894	17.90%	2,126	11,894	17.90%	1,948	11,894	16.40%	1,726	11,894	14.50%

Source: Environmental Science Associates, 2008; Metropolitan Transportation Commission Model Outputs 2008

GEOLOGY AND SEISMICITY

The proposed Project would likely result in the greatest number of specific transportation improvements being constructed in areas susceptible to geologic and seismic hazards, due simply to the fact that more new construction would occur under the proposed Project than under the other alternatives. However, the proposed Project would not result in any significant geologic or seismic risk that could not be mitigated to a less-than-significant level. Moreover, the new construction or re-construction or rehabilitation of transportation facilities would tend to reduce the overall seismic risk to users of those facilities. The proposed Project would include numerous projects that involve seismic retrofits or replacement of older, more earthquake-hazard prone facilities. For example, the reconstruction of a freeway overpass in an area prone to liquefaction would be considered a seismically beneficial impact as the more earthquake-hazard-prone overpass would be replaced. To the extent that the three Heavy Maintenance/Climate Protection Emphasis alternatives or the No Project Alternative would include fewer transportation improvements involving seismic upgrades than the proposed Project, these alternatives could result in incrementally greater impacts.

WATER RESOURCES

The proposed Project would likely result in the greatest potential direct, construction-related impacts on water resources, due to the fact that more new construction would occur at more specific locations under the proposed Project than under the other alternatives. The proposed Project would also have the greatest indirect and cumulative effects related to the intensification of regional urban uses associated with the expansion of roadways and other proposed transportation improvements, creating more impervious surfaces and increasing nonpoint-source pollutants, potentially affecting water quality, altering drainage patterns, and creating higher erosion rates and reduce groundwater recharge. However, all such impacts of the proposed Project could be mitigated to a less-than-significant level by mitigation measures identified in Chapter 2. Water resources impacts of each of the alternatives would be virtually the same, but because they involve fewer construction projects, their water resource impacts would incrementally be less substantial than those of the proposed Project. Like the proposed Project, these impacts could be mitigated to a less-than-significant level.

BIOLOGICAL RESOURCES

The proposed Project would likely result in the greatest potential direct, construction-related impacts on wetlands, special status species, and designated or proposed critical habitat, due to the fact that more new construction would occur at more locations under the proposed Project than under the other alternatives. However, at the programmatic level, it is not possible to identify the precise impacts of specific transportation improvement projects on the above-noted resources or on long-term fragmentation of undeveloped lands that serve as plant and animal habitat. It can be anticipated that the Heavy Maintenance/Climate Protection Emphasis + Land Use alternative would act somewhat more strongly than the proposed Project or the other alternatives to direct development towards already urbanized areas and to increase density, rather than contributing to sprawl and lower-density development that requires the conversion of biologically sensitive resource lands. Likewise, to the extent that the Heavy Maintenance/Climate Protection Emphasis + Pricing alternative motivates travelers to locate in urban centers, that alternative could also result in less open space land conversion. In this respect, the two Heavy Maintenance/Climate Protection Emphasis alternative variations would be likely to have incrementally lesser long-term impacts on biological resources in the region. As with the proposed Project, it is anticipated that

effects of each of the alternatives on biological resources, although potentially significant, could be mitigated to a less-than-significant level with measures identified in Chapter 2, with the exception of effects on special-status species from construction related to specific transportation improvements. This impact is considered potentially significant and unavoidable for all alternatives due to the practical difficulty of ensuring adequate mitigation for effects on species at a programmatic level of analysis.

VISUAL RESOURCES

The Transportation 2035 Plan contains new commitments with potentially significant visual impacts in scenic corridors and thus would have the greatest visual impact compared to all the other alternatives.

The Heavy Maintenance/Climate Protection Emphasis alternative focuses almost entirely on system maintenance which would not significantly change the physical configuration of existing transportation facilities and is unlikely to have effects on views. The Heavy Maintenance/Climate Protect Emphasis + Pricing alternative would have visual impacts similar to Heavy Maintenance Alternative because pricing strategies would not involve projects that would create visual contrasts or new visual elements. The Heavy Maintenance/Climate Protection Emphasis + Land Use alternative would have similar direct visual impacts as the Heavy Maintenance Alternative as well because it would not involve the construction of additional new transportation infrastructure. However, cumulatively, the Heavy Maintenance/Climate Protection Emphasis + Land Use alternative may result in more visual impacts related to infill development and intensification of existing urban areas, compared to the proposed Project and each of the other alternatives.

The No Project alternative does not contain any new commitments, and thus has the fewest investment projects with potentially significant visual impacts.

In summary, all three Heavy Maintenance/Climate Protection Emphasis alternatives and the No Project alternative are environmentally superior to the proposed Project and negligibly different from one another in terms of visual resource impacts.

CULTURAL RESOURCES

Because it contains the most new construction, the proposed Project will have the most potential to disturb, disrupt, or significantly affect cultural resources, including historical, archaeological, and paleontological resources and human remains.

- The No Project alternative consists of investment projects that have full funding commitments and does not include new construction projects, so it has less potential to affect cultural resources.
- The Heavy Maintenance/Climate Protection Emphasis alternative includes the projects that are fully committed and some new construction projects that focus almost entirely on system maintenance. Because system maintenance projects are unlikely to include ground-disturbing activities or activities which will create significant visual changes adjacent to historic structures or landmarks, the Heavy Maintenance/Climate Protect Emphasis alternative will have less potential to affect cultural resources than the proposed Project. The potential

impacts of the No Project and Heavy Maintenance alternatives are approximately the same since the ground-disturbing activity in each alternative is approximately the same.

- The Heavy Maintenance/Climate Protection Emphasis + Pricing alternative focuses on system maintenance and pricing strategies. Pricing strategies do not result in any construction or ground-disturbing activities so the potential for cultural impacts is the same as the Heavy Maintenance/Climate Protect Emphasis alternative.
- The Heavy Maintenance/Climate Protection Emphasis + Land Use alternative could have slightly less potential archaeological and paleontological impacts than the Heavy Maintenance/Climate Protection Emphasis alternative because it presumes more development in areas that are urbanized, already disturbed, and likely to have been subject to previous cultural surveys. However, projects within urbanized areas that entail ground-disturbing activity still have some potential to disturb or destroy resources. Projects within urbanized areas could have slightly greater historical resource impact because infill development has a greater potential to affect identified historic structures. However, there is also a chance of encountering unidentified historic resources in non-urbanized areas. Thus, the overall potential cultural resources impact is similar to that in the Heavy Maintenance/Climate Protection Emphasis alternative.

In summary, due to the difference in potential new construction, all alternatives are somewhat preferable to the proposed Project and negligibly different from one another in terms of cultural resource impacts.

GROWTH-INDUCING EFFECTS

As described in Chapter 2.12, the proposed Project is not expected to induce growth in the region beyond that projected in ABAG's *Projections 2007*. The primary reasons for this *de minimis* conclusion are (abbreviated from Chapter 2.12):

- Historically, transportation investment in general, and increased transportation capacity in particular, lag behind the growth that occurs in the Bay Area;
- Due to the maturity of development in the region and the existing transportation system and mode choices already available, incremental corridor improvements are expected to play a minimal role in attracting or inducing new development to the region as a whole;
- Most of the local agencies in the Bay Area with land use jurisdiction over territory that lies along the urban/rural boundaries have adopted a wide variety of growth management regulations to manage urban sprawl;
- Population growth is limited by the historic inability of the Bay Area to provide affordable housing to meet demand; and
- There have been recent changes in local land use and investment decision-making geared toward fewer car trips, smaller cars, transit accessibility, infill development, and overall reduced environmental impacts of Bay Area lifestyles.

Growth-inducing effects may occur at the local level (movement within the region rather than into the region; and the allocation of anticipated future residents to specific places over others), but these effects would be consistent with *Projections 2007*, which anticipates more infill and densification in urban centers.

Likewise, the alternatives to the proposed Project would not have regional growth-inducing effects for the same reasons as those given for the proposed Project. Similar to the proposed Project, the alternatives may result in local growth-inducing effects, particularly in the case of the Heavy Maintenance/Climate Protection Emphasis + Land Use alternative, where additional policy pressures would be implemented at the regional level to concentrate growth even more strictly toward transit and urban centers. As the networks for the Heavy Maintenance/Climate Protection Emphasis alternative and the No Project alternative are essentially the same, the localized growth inducing effects are essentially the same as well, and would be consistent with *Projections 2007*.

ENVIRONMENTALLY SUPERIOR ALTERNATIVE

CEQA Guidelines require each EIR to identify the environmentally superior alternative among the alternatives analyzed. If the No Project alternative is identified as the environmentally superior alternative, then the EIR must identify another alternative from among the alternatives analyzed.

There are numerous tradeoffs in impacts associated with the various alternatives. The alternatives also would result in varying degrees of success at achieving the Transportation 2035 Plan goals and objectives.

As a reminder, the adopted goals of the proposed Project are maintenance and safety, reliability, efficient freight travel, security and emergency management, clean air, climate protection, equitable access, and livable communities. The performance objectives designed to measure the region's progress towards meeting these goals include: reducing vehicle miles traveled, congestion and carbon dioxide and particulate matter emissions, and collisions/fatalities; decreasing transportation and housing costs for low-income families; and improving system maintenance. Therefore, an alternative that performs substantially worse than the proposed Project with respect to meeting the plan goals would not achieve even the basic objectives of the proposed Project.

ENVIRONMENT

According to the analysis, the Heavy Maintenance/Climate Protection Emphasis + Pricing alternative and the Heavy Maintenance/Climate Protection + Land Use alternative perform better than the proposed Project overall, while the No Project and the Heavy Maintenance/Climate Protection Emphasis alternative perform comparably or slightly worse than the proposed Project. More specifically:

- In **Transportation**, the Heavy Maintenance/Climate Protection Emphasis + Land Use alternative is the environmentally superior alternative. Considering multiple factors, it performs better than the proposed Project and the other alternatives primarily due to the projected increased proximity of population and jobs to transit and to one another;
- In **Energy and Climate Change**, the Heavy Maintenance/Climate Protection Emphasis + Pricing alternative is the environmentally superior alternative. It performs somewhat better than the proposed Project and the other alternatives, due mostly to decreased congestion which allows fewer emissions per mile traveled;

- In **Air Quality, Water Resources, Biological Resources, Visual Resources, and Cultural Resources**, the Heavy Maintenance/Climate Protection Emphasis + Pricing alternative and Heavy Maintenance/Climate Protection + Land Use alternative perform equally well, and better than the proposed Project, due to less new construction and therefore less natural land conversion to transportation use, fewer emissions, and fewer opportunities for disrupting visual or cultural resources;
- In **Noise and Geology**, the proposed Project is the environmentally superior alternative. This is because the physical improvements contained within the proposed Project create the least new exposure to noise (least new exposure to 66 dBA, as well as least exposure to change of 3 dBA or more), and new projects built or renovated to current engineering codes are likely to be less vulnerable to seismic activity than older projects; and
- In only one issue area—**Land Use**—is the No Project the environmentally superior alternative. This is because the three Heavy Maintenance/Climate Protection Emphasis alternatives include additional transportation investments, which could result in marginally more land use impact (particularly urban land use disruption or displacement) than the set of transportation investments within the No Project alternative.

However, from the cumulative perspective, the Heavy Maintenance/Climate Protection Emphasis + Land Use alternative may in fact be environmentally superior because it has the potential to decrease wider regional open space conversion to urban use by directing population growth and development to existing urban centers.

Though both the Heavy Maintenance/Climate Protection Emphasis alternative + Land Use alternative and Heavy Maintenance/Climate Protection + Pricing alternative perform very well, this CEQA analysis concludes that **the Heavy Maintenance/Climate Protection Emphasis + Pricing alternative is the environmentally superior alternative**, primarily because:

- It demonstrated superior performance in Energy and Climate Change issue areas which are of critical concern to the Bay Area today;
- It has more potential flexibility of applying and adjusting pricing controls to current needs;
- It can in theory be applied “immediately” and begin realizing environmental benefits sooner than land use change; and
- It has a stronger potential market influence on new “green” technologies than land use changes.

In the interest of transparency and disclosure, the project objectives and feasibility discussion below carry through both the Heavy Maintenance/Climate Protection + Pricing alternative and the Heavy Maintenance/Climate Protection + Land Use alternative.

PROJECT OBJECTIVES

In terms of objectives, the Heavy Maintenance/Climate Protection Emphasis alternative with the pricing and land use variations are both likely to meet most of the basic project objectives of the proposed Project:

- **Maintenance & Safety** (both of these alternatives provide more spending on maintenance, operations, and shortfalls than the proposed Project);

- **Reliability and Equitable Access** (the Land Use alternative performed best and the Pricing alternative performed second-best in the Transportation issue area);
- **Livable Communities** (both of these alternatives provide more funding than the proposed Project for the Transportation for Livable Communities Program, the Regional Bicycle Network, Transportation Climate Action Campaign, and the Lifeline Transportation Program);
- **Clean Air** (both Land Use and Pricing alternative variations perform better than the proposed Project in the Air Quality analysis); and
- **Climate Protection** (Pricing performed best and Land Use performed second-best in the Greenhouse Gas Emissions comparison).

It is less clear how the Heavy Maintenance/Climate Protection Emphasis + Pricing alternative and Heavy Maintenance/Climate Protection + Land Use alternative would perform in regards to the two remaining performance objectives, Efficient Freight Travel and Security & Emergency Management, particularly without the full program of improvements in the proposed Project. Nonetheless, given that both the Pricing and the Land Use alternatives perform better than the proposed Project in the transportation analysis, it would seem that they could also result in more efficient freight travel and perhaps better transportation security and emergency management.

FEASIBILITY

Despite this favorable evaluation for the Heavy Maintenance/Climate Protection Emphasis + Pricing and Heavy Maintenance/Climate Protection + Land Use, there are some important unanswered questions about the feasibility of each of these alternatives:

- The performance of the Heavy Maintenance/Climate Protection Emphasis + Land Use alternative is predicated on hypothetical land use assumptions that cannot be realized without substantial governmental intervention, through regulation or new incentives to create public funding for housing and infrastructure improvements and increased levels of public services and facilities which would be needed by the proposed intensification of residential development in the urban core. The regional agencies (MTC, ABAG, BCDC, and BAAQMD) do not currently have the power to enforce the assumed land use outcomes; local governments currently have authority over local land use decisions. Unresolved conflicts with local General Plans, “community character” concerns, and local economic development objectives also would affect realization of these land use assumptions.
- The performance of the Heavy Maintenance/Climate Protection Emphasis + Pricing alternative also presumes that regional agencies have certain authority to impose new pricing strategies, most of which are subject to legislative or voter approval. For those strategies that require legislative or voter approval, any economic downturn reduces public support for “taxing” schemes that intentionally raise the price of driving, particularly in the short term before households can locate closer to urban centers and transit. Though the Regional HOT Network will require new legislative authority to implement in the Bay Area, the magnitude of the legislative changes required for the aggressive pricing strategies proposed under this alternative are greater and possibly more contentious than changes required for the HOT Network.

While there were compelling reasons to evaluate both of these alternatives in full through this EIR, the feasibility issues here indicate that MTC and its partners lack the authority to implement them. Rather, the onus rests on outside agencies (local governments, primarily, but also State agencies such as Caltrans) over which MTC has no direct control. Ultimately, policy makers must decide if the underlying assumptions made for the Heavy Maintenance/Climate Protection Emphasis + Pricing Emphasis alternative and the Heavy Maintenance/Climate Protection Emphasis + Land Use alternative are reasonable, feasible, and consistent with and supportive of the Transportation 2035 Plan's goals and objectives. Also, policy makers will be required to judge the relative importance of the various issue areas in making their final decision. The Commission will address these questions during its deliberations on this EIR.

Table 3.1-16: Summary of Alternatives Comparison to the Proposed Project

<i>Proposed Project</i>	<i>No Project</i>	<i>Heavy Maintenance/ Climate Protection</i>	<i>Heavy Maintenance/ Climate Protection + Pricing</i>	<i>Heavy Maintenance/ Climate Protection + Land Use</i>
Transportation				
High level of accessibility to jobs by autos and transit compared to existing conditions	Slightly lower accessibility to jobs by autos, and considerably lower accessibility to jobs by transit compared to proposed Project	Slightly lower accessibility to jobs by autos, and considerably lower accessibility to jobs by transit compared to proposed Project	Slightly higher level of accessibility to jobs by autos; considerably lower accessibility to jobs by transit compared to proposed Project	Considerably higher accessibility to jobs by autos; significantly higher access to jobs by transit compared to proposed Project
Increased VMT at LOS F for all facility types compared to existing conditions	Greater VMT at LOS F compared to proposed Project	Greater VMT at LOS F compared to proposed Project	Greater VMT at LOS F for freeways compared to proposed project but slightly fewer VMT at LOS F for expressways and arterials compared to proposed Project	Greater VMT at LOS F for freeways compared to proposed project but considerably fewer VMT at LOS F for expressways and arterials compared to proposed Project
Slight increase in per capita VMT compared to existing conditions	Slight increase in per capita VMT compared to proposed Project	Slight increase in per capita VMT compared to proposed Project	Slight decrease in per capita VMT compared to proposed Project	Slight decrease in per capita VMT compared to proposed Project
Air Quality				
Short-term construction-related emission impacts due to construction of projects in proposed Project	Slightly lower short-term construction-related emission impacts due to construction of fewer projects	Slightly lower short-term construction-related emission impacts due to construction of fewer projects	Slightly lower short-term construction-related emission impacts due to construction of fewer projects	Slightly lower short-term construction-related emission impacts due to construction of fewer projects

Table 3.1-16: Summary of Alternatives Comparison to the Proposed Project

<i>Proposed Project</i>	<i>No Project</i>	<i>Heavy Maintenance/ Climate Protection</i>	<i>Heavy Maintenance/ Climate Protection + Pricing</i>	<i>Heavy Maintenance/ Climate Protection + Land Use</i>
Decreased ground-level ozone emissions (ROG, NO _x) and carbon monoxide emissions from motor vehicle sources compared to existing conditions; higher PM ₁₀ and PM _{2.5} compared to existing conditions	Slightly higher ground-level ozone and particulate matter emissions from motor vehicle sources than proposed Project	Slightly ground-level ozone and particulate matter emissions from motor vehicle sources than proposed Project	Slightly lower I ground-level ozone and particulate matter emissions from motor vehicle sources than proposed Project	Slightly lower ground-level ozone and particulate matter emissions from motor vehicle sources than proposed Project
Lower level of TAC emissions from motor vehicle sources compared to existing conditions	Slightly higher level of TAC emissions from motor vehicle sources than proposed Project but this difference is not significant	Slightly higher level of TAC emissions from motor vehicle sources than proposed Project but this difference is not significant	Slightly lower level of TAC emissions from motor vehicle sources than proposed Project but this difference is not significant	Slightly lower level of TAC emissions from motor vehicle sources than proposed Project but this difference is not significant
Land Use				
Approximately 1,400 acres of farmland could potentially be affected by 142 projects in 8 counties	Less farmland impacted: About 260 acres in 7 counties	Less farmland impacted: About 300 acres in 8 counties	Less farmland impacted: About 300 acres in 8 counties	Substantially less farmland impacted: About 300 acres in 8 counties, plus conservation related to directing development to urban centers
Approximately 2,150 acres of existing land use could potentially be disrupted by 149 projects in 9 counties	Significantly fewer land uses disrupted: About 200 acres in 7 counties	Fewer land uses disrupted: About 300 acres in 8 counties	Fewer land uses disrupted: About 300 acres in 8 counties	Fewer land uses disrupted: About 300 acres in 8 counties, but perhaps more community disruption related to infill development and densification
Potential for short term community disruption due to construction activity	Substantially less potential for short term disruption due to fewer construction projects	Substantially less potential for short term disruption due to fewer construction projects	Substantially less potential for short term disruption due to fewer construction projects	Substantially less potential for short term disruption due to fewer construction projects

Table 3.1-16: Summary of Alternatives Comparison to the Proposed Project

<i>Proposed Project</i>	<i>No Project</i>	<i>Heavy Maintenance/ Climate Protection</i>	<i>Heavy Maintenance/ Climate Protection + Pricing</i>	<i>Heavy Maintenance/ Climate Protection + Land Use</i>
Energy				
Decreased transportation energy consumption compared to existing conditions	Increased transportation energy consumption compared to the proposed Project	Increased transportation energy consumption compared to the proposed Project	Decreased transportation energy consumption compared to the proposed Project	Decreased transportation energy consumption compared to the proposed Project
Climate Change and Greenhouse Gases				
Decreased CO ₂ and CO ₂ e emissions compared to existing conditions	Increased CO ₂ and CO ₂ e emissions compared to the proposed Project	Increased CO ₂ and CO ₂ e emissions compared to the proposed Project	Decreased CO ₂ and CO ₂ e emissions compared to the proposed Project	Decreased CO ₂ and CO ₂ e emissions compared to the proposed Project
Increased vulnerability to sea level rise compared to existing conditions	More vulnerability to sea level rise compared to the proposed Project	Slightly more vulnerability to sea level rise compared to the proposed Project	Comparable or slightly less vulnerability to sea level rise compared to proposed Project	Comparable or slightly more vulnerability to sea level rise compared to the proposed Project
Noise				
Significant temporary construction-related noise impacts on surrounding areas.	Temp. construction-related noise impacts. Far fewer projects=lower overall construction-related noise	Temp. construction-related noise impacts. Fewer projects=lower overall construction-related noise	Temp. construction-related noise impacts. Fewer projects=lower overall construction-related noise	Temp. construction-related noise impacts. Fewer projects=lower overall construction-related noise
Overall increase in roadway miles exposed to noise levels at or above 66 dBA, compared to existing conditions	Slightly more roadway miles exposed to noise levels at or above 66 dBA compared to the proposed Project	Slightly more roadway miles exposed to noise levels at or above 66 dBA compared to the proposed Project	Slightly more roadway miles exposed to noise levels at or above 66 dBA compared to the proposed Project	Slightly more roadway miles exposed to noise levels at or above 66 dBA compared to the proposed Project
Overall growth in areas subject to 3 dBA or more increase in noise levels compared to existing conditions	Slightly more areas experience a 3 dBA or more increase in noise levels compared to the proposed Project	Slightly more areas experience a 3 dBA or more increase in noise levels compared to the proposed Project	Slightly more areas experience a 3 dBA or more increase in noise levels compared to the proposed Project	Slightly more areas experience a 3 dBA or more increase in noise levels compared to the proposed Project
Geology and Seismicity				
Overall increase in seismic safety due to retrofits and engineering standards for new projects, compared to existing conditions	Less of an increase in seismic safety, compared to the proposed Project	Less of an increase in seismic safety, compared to the proposed Project	Less of an increase in seismic safety, compared to the proposed Project	Less of an increase in seismic safety, compared to the proposed Project

Table 3.1-16: Summary of Alternatives Comparison to the Proposed Project

<i>Proposed Project</i>	<i>No Project</i>	<i>Heavy Maintenance/ Climate Protection</i>	<i>Heavy Maintenance/ Climate Protection + Pricing</i>	<i>Heavy Maintenance/ Climate Protection + Land Use</i>
Potential for increased soil erosion associated with construction	Somewhat less potential for increased construction-related soil erosion	Somewhat less potential for increased construction-related soil erosion	Somewhat less potential for increased construction-related soil erosion	Somewhat less potential for increased construction-related soil erosion
Some increase in potential long-term maintenance or repair of soil expansion or settlement impacts	Less of an increase in soil expansion or settlement impacts	Negligible decrease in soil expansion or settlement impacts	Negligible decrease in soil expansion or settlement impacts	Negligible decrease in soil expansion or settlement impacts
Water Resources				
Increased potential adverse impacts on water quality associated with construction compared to existing conditions	Fewer potential adverse construction related impacts compared to the proposed Project	Fewer potential adverse construction related impacts compared to the proposed Project	Fewer potential adverse construction related impacts compared to the proposed Project	Fewer potential adverse construction related impacts compared to the proposed Project
Increased adverse impacts on water quality, flooding, or groundwater resources due to increased impervious surface area, compared to existing conditions	Smaller increases in impervious surface area compared to the proposed Project	Smaller increases in impervious surface area compared to the proposed Project	Smaller increases in impervious surface area compared to the proposed Project	Smaller increases in impervious surface area compared to the proposed Project
Biological Resources				
May adversely affect wetlands and aquatic resources, compared to existing conditions	Less adverse affect on wetlands and aquatic resources, compared to the proposed Project	Less adverse affect on wetlands and aquatic resources, compared to the proposed Project	Less adverse affect on wetlands and aquatic resources, compared to the proposed Project	Less adverse affect on wetlands and aquatic resources, compared to the proposed Project
May cause substantial disturbance of biologically unique or sensitive communities, compared to existing conditions	Less disturbance compared to the proposed Project	Less disturbance compared to the proposed Project	Less disturbance compared to the proposed Project	Substantially less disturbance compared to the proposed Project
May adversely affect special-status plant and/or wildlife species compared to existing conditions	Less adverse affect on special-status species compared to the proposed Project	Less adverse affect on special-status species compared to the proposed Project	Less adverse affect on special-status species compared to the proposed Project	Substantially less adverse affect on special-status species compared to the proposed Project

Table 3.1-16: Summary of Alternatives Comparison to the Proposed Project

<i>Proposed Project</i>	<i>No Project</i>	<i>Heavy Maintenance/ Climate Protection</i>	<i>Heavy Maintenance/ Climate Protection + Pricing</i>	<i>Heavy Maintenance/ Climate Protection + Land Use</i>
May adversely affect proposed or designated critical habitats, compared to existing conditions	Less adverse affect on critical habitats compared to the proposed Project	Less adverse affect on critical habitats compared to the proposed Project	Less adverse affect on critical habitats compared to the proposed Project	Substantially less adverse affect on critical habitats compared to the proposed Project
Construction activities could adversely affect nonlisted nesting bird (including raptor) species considered special-status, compared to existing conditions	Less adverse construction-related impact on nonlisted nesting raptor species compared to the proposed Project	Less adverse construction-related impact on nonlisted nesting raptor species compared to the proposed Project	Less adverse construction-related impact on nonlisted nesting raptor species compared to the proposed Project	Substantially less adverse construction-related impact on nonlisted nesting raptor species compared to the proposed Project
May conflict with adopted resource protection or conservation plans, compared to existing conditions	Comparable level of conflict with adopted resource protection or conservation plans, compared to the proposed Project	Comparable level of conflict with adopted resource protection or conservation plans, compared to the proposed Project	Comparable level of conflict with adopted resource protection or conservation plans, compared to the proposed Project	Comparable level of conflict with adopted resource protection or conservation plans, compared to the proposed Project
Could contribute to the removal or fragmentation of habitat area, compared to existing conditions	Less contribution to removal or fragmentation of habitat area compared to the proposed Project	Less contribution to removal or fragmentation of habitat area compared to the proposed Project	Less contribution to removal or fragmentation of habitat area compared to the proposed Project	Substantially less contribution to removal or fragmentation of habitat area compared to the proposed Project
Visual Resources				
Could affect visual resources during construction of projects, compared to existing conditions	Less impact on visual resources during construction, compared to the proposed Project	Less impact on visual resources during construction, compared to the proposed Project	Less impact on visual resources during construction, compared to the proposed Project	Less impact on visual resources during construction, compared to the proposed Project
Could block public views or change the visual character and quality of designated or eligible State Scenic Highways, compared to existing conditions	Less potential to block public views or change the visual character and quality of designated or eligible State Scenic Highways, compared to the proposed Project	Less potential to block public views or change the visual character and quality of designated or eligible State Scenic Highways, compared to the proposed Project	Less potential to block public views or change the visual character and quality of designated or eligible State Scenic Highways, compared to the proposed Project	Less potential to block public views or change the visual character and quality of designated or eligible State Scenic Highways, compared to the proposed Project

Table 3.1-16: Summary of Alternatives Comparison to the Proposed Project

<i>Proposed Project</i>	<i>No Project</i>	<i>Heavy Maintenance/ Climate Protection</i>	<i>Heavy Maintenance/ Climate Protection + Pricing</i>	<i>Heavy Maintenance/ Climate Protection + Land Use</i>
Construction of soundwalls could alter views compared to existing conditions	Less potential for construction of soundwalls to alter views, compared to the proposed Project	Less potential for construction of soundwalls to alter views, compared to the proposed Project	Less potential for construction of soundwalls to alter views, compared to the proposed Project	Less potential for construction of soundwalls to alter views, compared to the proposed Project
Cultural Resources				
Ground disturbing activities have the potential to disturb, destroy, or significantly affect archeological, paleontological, Native American artifacts and sacred sites, or human remains, compared to existing conditions	Less of a potential to disturb, destroy, or significantly affect cultural resources, compared to the proposed Project	Less of a potential to disturb, destroy, or significantly affect cultural resources, compared to the proposed Project	Less of a potential to disturb, destroy, or significantly affect cultural resources, compared to the proposed Project	Substantially less of a potential to disturb, destroy, or significantly affect cultural resources, compared to the proposed Project
Urban development has the potential to disturb, destroy, or significantly affect historic resources, compared to existing conditions	Less of a potential to disturb, destroy, or significantly affect historic resources, compared to the proposed Project	Less of a potential to disturb, destroy, or significantly affect historic resources, compared to the proposed Project	Less of a potential to disturb, destroy, or significantly affect historic resources, compared to the proposed Project	Less of a potential to disturb, destroy, or significantly affect historic resources, compared to the proposed Project, but somewhat more than the other alternatives

3.2 CEQA Required Conclusions

This chapter summarizes the impacts of the proposed Transportation 2035 Plan in several subject areas specifically required by CEQA, including significant irreversible changes, significant unavoidable impacts, cumulative impacts, and impacts found to be not significant. These subject areas are evaluated based on the analysis in *Part Two: Settings, Impacts, and Mitigation Measures*, of this EIR.

SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES

Significant irreversible environmental changes are those irretrievable commitments that consign non-renewable resources to uses that future generations will probably be unable to reverse. Irretrievable commitments of non-renewable resources associated with the transportation improvements in the proposed Transportation 2035 Plan would include:

- Consumption of significant amounts of nonrenewable energy for construction, maintenance, and operation of transportation improvements, even if energy use rates do not exceed existing use rates;
- Use of building materials, fossil fuels, and other resources for construction, maintenance and operation of transportation improvements; and
- Conversion of some resource lands, such as agricultural land, habitat areas, and other undeveloped lands into transportation uses.

SIGNIFICANT UNAVOIDABLE IMPACTS

Significant unavoidable impacts are those that cannot be mitigated to a level that is less than significant. *Part Two* of this EIR identified the following significant unavoidable impacts when comparing the proposed Transportation 2035 Plan to existing conditions:

- Increased vehicle miles traveled at Level of Service F for freeways, expressways, and arterial facilities;
- Increased construction-related emissions of criteria pollutants;
- Increased PM₁₀ and PM_{2.5} emissions;
- Individually and cumulatively considerable conversion of farmland, including prime agricultural land designated by the State of California, to transportation use;
- Disruption or displacement of existing land uses, neighborhoods, and communities in the short-term;
- Cumulatively considerable increase in noise levels along some travel corridors;
- Adverse effects on special-status plant and/or wildlife species identified as endangered, candidate, and/or special status by the CDFG or USFWS;
- Cumulatively considerable conversion of undeveloped land to urban uses, contributing to the removal or fragmentation of habitat area;

- Individual and cumulative degradation of visual resources by adding or expanding development in rural or open space areas, blocking views from adjoining areas, blocking or intruding into important vistas, and changing the scale, character, and quality of designated or eligible Scenic Highways.

CUMULATIVE IMPACTS

In this EIR, the cumulative impact analysis considers the possible effects of all the projects in the proposed Transportation 2035 Plan together with projected regional growth and the increase in regional travel produced by the Bay Area's growth in population and jobs as presented in ABAG's *Projections 2007*. This kind of cumulative impact is not specific to the Bay Area, but is characteristic of any area that is experiencing population and employment growth. The Transportation, Air Quality, Energy, Greenhouse Gas, and Noise impact analyses are all cumulative in nature because the indicators being measured (e.g. vehicle miles traveled, emissions, noise) are the result of many interrelated activities and the significance of the proposed Transportation 2035 Plan is only apparent when it is considered in conjunction with those wider regional development patterns.

Significant cumulative impacts are identified by issue area in *Part Two: Settings, Impacts, and Mitigation Measures*, and summarized again here. The proposed Project's contribution to the cumulative impact is also indicated in italics.

- Vehicle miles traveled at Level of Service F would increase for both freeways and expressways and arterial facilities when compared to existing conditions (*Project Contribution Not Cumulatively Considerable*);
- Implementation of Transportation 2035 Plan projects, combined with projected regional growth, would result in increased emissions of PM₁₀ and PM_{2.5} over existing conditions (*Project Contribution Not Cumulatively Considerable*);
- Concurrent implementation of the proposed Transportation 2035 Plan and forecast development would result in cumulatively considerable conversion of Prime and Important farmlands to urban use throughout the Bay Area (*Project Contribution Cumulatively Considerable*);
- Implementation of Transportation 2035 Plan projects, combined with forecast regional growth, would contribute to GHG emissions (*Project Contribution Not Cumulatively Considerable*);
- Transportation 2035 Plan projects, combined with future forecast development in the region, have the potential to result in a cumulatively considerable increase in exposure to risk related to sea level rise (*Project Contribution Not Cumulatively Considerable*);
- Implementation of transportation projects included in the proposed Transportation 2035 Plan, combined with traffic related to projected regional population and employment growth, could result in a cumulatively considerable increase in overall noise levels along some travel corridors (*Project Contribution Cumulatively Considerable*);
- The proposed Transportation 2035 Plan, combined with regional population growth, would result in an increased risk of exposure of people and property to geologic hazards (*Project Contribution Not Cumulatively Considerable*);

- Concurrent implementation of the proposed Transportation 2035 Plan and projected regional development could contribute to degradation of regional water quality, reduction of groundwater recharge, or result in increased flooding hazards (*Project Contribution Not Cumulatively Considerable*);
- Transportation 2035 Plan projects, combined with forecast urban development, could contribute to the removal or fragmentation of habitat area (*Project Contribution Cumulatively Considerable*); and
- Concurrent implementation of the proposed Transportation 2035 Plan and regional and local land use plans would result in a cumulatively considerable change in the visual character of many areas in the region (*Project Contribution Cumulatively Considerable*).

IMPACTS FOUND NOT TO BE SIGNIFICANT

This EIR focuses on potentially significant impacts. CEQA requires that an EIR provide a brief statement indicating why various possible significant impacts were determined to not be significant and were not discussed in detail. For the issue areas addressed in *Part Two*, all potential impacts are identified, regardless of their magnitude. Issue areas determined to not be significant and not addressed in this EIR include the following.

HAZARDOUS MATERIALS

Hazardous materials are already highly regulated at the federal and State level. The existing regional transportation system already carries vehicle that transport hazardous materials. It was determined that the changes proposed to the transportation system through the Transportation 2035 Plan are *de minimis* as they relate to changes in the handling, location of, or exposure to hazardous materials. If a specific transportation project were to be adjacent to a hazardous materials site, a project-specific environmental document would address the impact. No significant impacts related to hazardous materials are expected to occur as a result of the proposed Transportation 2035 Plan.

MINERAL RESOURCES

The proposed Transportation 2035 Plan will not affect mineral resources, as no substantive mineral resources have been identified in areas where new transportation improvements will occur.

PUBLIC SERVICES AND UTILITIES

Implementation of the proposed Transportation 2035 Plan will not cause a significant increase in demand for public services or utilities.

RECREATION

No significant adverse effects on recreational uses or facilities are expected. Minor, short-term adverse effects may occur if proposed Transportation 2035 projects are constructed near recreational facilities.

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Bibliography

Two of the steps in conducting research are the selection of Part 1 and Part 2. Both steps are essential. The first step is to select a topic that is relevant to the research.

PLANNING AND QUALITY

Appendix 1: Appendix 1: Appendix 1

Appendix 1: Appendix 1: Appendix 1

Part Four

Bibliography and Appendices

Appendix 1: Appendix 1: Appendix 1

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Appendix 1: Appendix 1: Appendix 1

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Appendix A:

Notice of Preparation

Notice of Preparation (NOP)

NOTICE OF PREPARATION OF A FINAL ENVIRONMENTAL IMPACT STATEMENT
FOR THE TRANSPORTATION IMPROVEMENT PROJECT

Lead Agency: Southern Transportation Commission
1000 Main Street
Costa Mesa, CA 92626
Phone: (714) 261-1000
Fax: (714) 261-1001
Email: info@stc.org

The Metropolitan Transportation Commission (MTC), an agency of the State of California, is preparing a Final Environmental Impact Statement (EIS) for the Transportation Improvement Project (TIP) in cooperation with the California Environmental Quality Act (CEQA).

The Notice of Preparation (NOP) is prepared to provide information about the project and the content of the environmental information that will be included in the EIS. It is a document that provides information about the project and the content of the environmental information that will be included in the EIS. It is a document that provides information about the project and the content of the environmental information that will be included in the EIS.

The project is a transportation improvement project that will be implemented in the State of California. The project is a transportation improvement project that will be implemented in the State of California.

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It is the policy of the State of California to provide information about the project and the content of the environmental information that will be included in the EIS. It is the policy of the State of California to provide information about the project and the content of the environmental information that will be included in the EIS.

This notice is a notice of preparation of a final environmental impact statement. It is a notice of preparation of a final environmental impact statement. It is a notice of preparation of a final environmental impact statement. It is a notice of preparation of a final environmental impact statement.



METROPOLITAN
TRANSPORTATION
COMMISSION

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Notice of Preparation

To: Interested Agencies, Organizations, and Individuals

Subject: Notice of Preparation of a Draft Environmental Impact Report
for the Transportation 2035 Plan

Lead Agency:
Metropolitan Transportation Commission
101 Eighth Street
Oakland, CA 94607-4700

MTC Contact Person:
Ashley Nguyen, Project Manager
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The Metropolitan Transportation Commission (MTC), as the Lead Agency, will prepare a Draft Environmental Impact Report (EIR) for the Transportation 2035 Plan in accordance with the California Environmental Quality Act (CEQA).

This Notice of Preparation (NOP) is intended to seek comments with specific detail about the scope and content of the environmental information that will be evaluated in the EIR. Agencies who have statutory responsibilities in connection with the project to be evaluated should share their views. Such agencies will need to use the EIR prepared by our agency when considering a permit or other approval of a discrete project from the Transportation 2035 Plan.

Two regional scoping meetings will be held to solicit input on the scope and content of the Draft EIR, as follows:

Monday, March 10, 2008
10:00 a.m. to Noon
Joseph P. Bort MetroCenter
Claremont Conference Room
(See receptionist on 3rd Floor)
101 Eighth Street
Oakland, CA 94607

Thursday, March 13, 2008
6:00 p.m. to 8:00 p.m.
Joseph P. Bort MetroCenter
Lawrence D. Dahms Auditorium
101 Eighth Street
Oakland, CA 94607

All interested agencies, organizations and individuals are welcome to participate in the scoping meetings. Oral and written comments will be accepted at the scoping meetings.

Due to the time limits mandated by State law, your response must be sent at the earliest possible date but **no later than 30 days** after receipt of this notice. **Please send your response to Ashley Nguyen, Project Manager at the address shown above by March 21, 2008.** Remember to include a return address and the name of the contact person.

The project description, location and the potential environmental effects are contained in the attached materials. An Initial Study is not required and thus not prepared.

Project Title: Environmental Impact Report for the Transportation 2035 Plan

Project Location: San Francisco Bay Area Region, California
(Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo,
Santa Clara, Solano, and Sonoma Counties)

Attachment: Attachment A: Project Description & Scope of Environmental Analysis

Date: February 19, 2008

Please direct your inquiries and responses to Ashley Nguyen, Project Manager, at her contact information listed above.



Steve Herdinger
Executive Director

ATTACHMENT A

PROJECT DESCRIPTION & SCOPE OF ENVIRONMENTAL ANALYSIS

NOTICE OF PREPARATION

The Notice of Preparation (NOP), along with this Attachment A, is being issued to interested agencies, organizations and individuals, to solicit comments that will assist in the preparation of the Draft Environmental Impact Report (EIR) for the Transportation 2035 Plan, and to some degree, the preparation of the Transportation 2035 Plan itself. As a result of the responses to the NOP and staff analysis, the project description and scope of the environmental analysis described herein will likely be revised and then further refined through the course of developing the Transportation 2035 Plan and the EIR.

BACKGROUND

The Metropolitan Transportation Commission (MTC) is the transportation planning, coordinating and financing agency for the nine-county San Francisco Bay Area Region (which includes Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma Counties). Created by the State Legislature in 1970, MTC functions as both the regional transportation planning agency (RTPA)—a state designation—and for federal purposes, as the region's metropolitan planning organization (MPO).

As required by state and federal planning regulations, MTC is responsible for preparing the long-range Regional Transportation Plan (RTP) for the nine-county San Francisco Bay Area Region. An RTP is a long-range comprehensive blueprint for the development of mass transit, highway, railroad, bicycle and pedestrian facilities, airport and seaport. The RTP is to be updated every four years to take into account, amongst other issues, new projects and fund sources as well as updated planning assumptions, goals, and objectives. The plan is developed based on projections of growth in population and travel demand coupled with financial projections. The RTP currently in effect – *Transportation 2030 Plan* – was adopted in February 2005. The adoption of the Transportation 2030 Plan was accompanied by the certification of the EIR for the Transportation 2030 Plan. These documents may be downloaded from the following website: http://www.mtc.ca.gov/planning/2030_plan/index.htm.

The 2009 update of the RTP, which is underway, is referred to as the *Transportation 2035 Plan*. Like past plans, the Transportation 2035 Plan is a program of related actions designed to coordinate and manage future transportation improvements among the various counties/cities and transportation agencies operating within the region. As required by federal metropolitan planning regulations, the plan will be financially constrained to projected transportation revenues that are reasonably expected to be available over the 25-year planning period; however, the plan may also include a set of illustrative transportation projects that would have benefits if additional new revenue is secured in the future.

The EIR for the Transportation 2035 Plan is a program EIR as defined by the California Environmental Quality Act (CEQA). A program EIR allows MTC to look at the broad, regional impacts of the program of projects/programs in the RTP prior to adopting the RTP. As a programmatic document, this EIR also eliminates redundant or contradictory approaches to the consideration of regional and cumulative impacts. It serves as a basic reference document to avoid unnecessary repetition of facts or analysis in subsequent project-specific assessments. Note that this EIR does not evaluate site-specific impacts of individual projects, which all individual project sponsors are required to do in compliance with CEQA and/or NEPA.

TRANSPORTATION 2035 PLAN

Working in conjunction with the Association of Bay Area Governments (ABAG), the Bay Area Air Quality Management District (BAAQMD) and the Bay Conservation and Development Commission (BCDC) and in consultation with Caltrans, county Congestion Management Agencies, transit operators, Water Transit Authority, other transportation stakeholders, and the public, MTC is now preparing the latest update to this long-range RTP, which will guide the region through 2035.

The Transportation 2035 Plan will present a vision of what our transportation network should look like in 2035 — including what will be needed to address future growth and congestion, and the role transportation will play to meet current and future requirements to improve air quality and protect our climate. The vision for the Transportation 2035 will be guided by the Three Es of economy, environment, and equity, along with an ambitious set of plan goals and performance objectives. The plan goals include safety and maintenance, reliability, access to mobility, livable communities, clean air, efficient freight travel, transportation security, and climate protection.

The key financial assumption governing the financially constrained RTP is that existing sources of federal, state, regional, and local revenues such as voter-approved county sales tax measures are assumed to continue to 2035. To qualify for state or federal surface transportation funding, all Bay Area transportation projects — whether for transit, highways, local streets, railroads, or bicycle/pedestrian facilities — must be included in the financially constrained plan. In addition, the plan may also identify illustrative projects that may be funded in the future should funding opportunities arise through legislative or voter actions; these projects/programs would be identified in the “unconstrained” portion of the plan.

The preparation of a long-range RTP is typically a two-year planning effort. MTC began the Transportation 2035 planning effort in early 2007 and anticipates that the Commission will adopt the Transportation 2035 Plan in early 2009.

SCOPE OF ENVIRONMENTAL ANALYSIS

The EIR for the Transportation 2035 Plan will be prepared in compliance with the California Environmental Quality Act (CEQA) of 1970, as amended. In general, the purpose of the EIR is to:

- Analyze the potential environmental effects of the adoption of the RTP;
- Inform decision-makers, other responsible agencies, and members of the public as to the range of these environmental impacts of the RTP;
- Recommend a set of measures to mitigate any significant adverse regional impacts; and
- Analyze several alternatives to the proposed RTP.

Specifically, the EIR for the Transportation 2035 Plan will be a program EIR, which is a first-tier CEQA document designed to consider broad, regional impacts of a program of actions (CEQA Guidelines §15168). Therefore, the EIR will focus on the entire set of projects and programs contained in the RTP, rather than on individual projects. This EIR will evaluate potentially significant environmental impacts, and cumulative impacts, and will include mitigation measures to offset potentially significant effects. In addition, this EIR will be the basis for subsequent tiered CEQA documents for site-specific environmental reviews that will be conducted by implementing agencies as projects in the RTP are more clearly defined and more detailed studies prepared. Specific analysis of localized impacts in the vicinity of individual projects is not included in this program level EIR.

Under CEQA, key impact categories identified for analysis in this EIR include:

- Transportation
- Air Quality
- Energy (including global warming)
- Geology and Seismicity
- Biological Resources
- Water Resources
- Visual Resources
- Noise
- Cultural Resources
- Population, Housing and Social Environment
- Land Use

Impact categories not specifically addressed in this EIR include recreation, utilities and service systems, public services, and hazardous materials. No significant impacts of regional importance are expected to occur in these areas. These impact areas will be addressed in project-specific environmental documents.

PROJECT ALTERNATIVES

The preliminary draft project alternatives that may be evaluated in this EIR are described below. It is important to note that these alternatives will continue to be reviewed and refined before a Draft EIR is issued. More precise definitions of the alternatives, or new alternatives, will likely emerge as the EIR scoping and planning process for the RTP evolves. For all project alternatives described below, MTC will use the latest planning assumptions in the EIR analysis.

As previously described, the Proposed Project is the Transportation 2035 Plan:

Proposed Project – The Transportation 2035 Plan includes the set of transportation projects and programs that would be funded through revenues projected to be available over the 25-year horizon of the plan plus potential new revenue sources identified by MTC that could likely be achieved through either legislative action or voter mandate (referred to as the financially constrained portion of the plan). Projects will undergo project-level performance assessment and policy review to determine which projects will ultimately be included in the financially constrained plan.

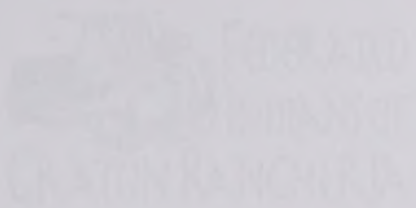
The following preliminary alternatives have been identified for analysis in the EIR:

Alternative 1: No Project Alternative – The No Project Alternative, required by CEQA, addresses the effect of not implementing the Transportation 2035 Plan. This includes a set of highway, transit, local roadway, bicycle and pedestrian projects that are in advanced planning stages and slated to go forward since they have full funding commitments. These projects are: (1) identified in the federally required Fiscal Year 2007 Transportation Improvement Program (TIP), a four-year funding program of Bay Area projects and programs, (2) not yet in the TIP but are fully funded sales tax projects authorized by voters in seven Bay Area counties, including San Francisco, Santa Clara, San Mateo, Alameda, Contra Costa, Sonoma and Marin counties, and (3) not yet in the TIP but fully funded through other committed funds as defined by MTC policy such as Regional Measure 1 Toll Bridge Program, Regional Measure 2 (RM-2) Traffic Congestion Relief Program, and Proposition 1B.

Alternative 2: Financially Constrained Project – This represents only the set of transportation projects and programs that would be funded through revenues projected to be available over the 25-year horizon of the RTP (financially constrained element of the Plan).

Alternative 3: New “Pricing Concepts” Project – This alternative involves modifying the set of transportation projects and programs included in the Proposed Project in order to pursue potential new transport pricing concepts that require new authority for implementation. New pricing concepts explored under this alternative may involve market-based pricing of roadway capacity, downtown pricing initiatives (e.g., cordon pricing, parking pricing), and/or an auto operating carbon/vehicle miles traveled (VMT) tax. There may be other new pricing concepts proposed during the Transportation 2035 planning process that may be appropriate for evaluating as part of this alternative.

Alternative 4: New “Non-Pricing Concepts” Project – This alternative involves modifying the set of transportation projects and programs included in the Proposed Project in order to pursue new non-pricing concepts that require new authority for implementation. The specific non-pricing concepts to be explored under this alternative will be further defined through scoping comments and as the RTP planning process unfolds.



San Juan del Rio, New Mexico
Cultural Resource Inventory
San Juan del Rio, N.M. 87450
703-240-2222

Appendix B:

Written Comments in Response to Notice of Preparation (NOP); Summary Public Scoping Meeting

U.S. Fish and Wildlife Service, 2025-2026

Dear Mr. [Name]:

The National System of Public Lands (NSPL) provides the opportunity to
comment on the proposed project in the NOP of the [Project Name].

NSPL provides the opportunity to comment on the proposed project in the
NOP of the [Project Name] and also provides the opportunity to the public
to comment on the proposed project. The proposed project is a [Project Name]
and the proposed project is a [Project Name]. The proposed project is a [Project Name]
and the proposed project is a [Project Name]. The proposed project is a [Project Name]
and the proposed project is a [Project Name].

Please comment on the proposed project in the following ways:

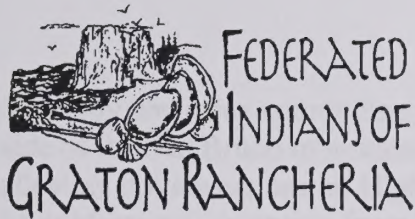
Responsible:

[Signature]

Mike Jones
California, San Juan del Rio, New Mexico

703-240-2222

800-240-2222



Sacred Sites Protection Committee
6400 Redwood Drive, Suite 300
Rohnert Park, CA 94928
707- 566-2288

February 28, 2008

Metropolitan Transportation Commission
Attention: Ashley Nguyen, EIR Project Manager
101 Eighth Street
Oakland, CA 94607

RE: Draft EIR for the 2035 Transportation Plan

Dear Ms. Nguyen:

The Federated Indians of Graton Rancheria (FIGR) appreciates the opportunity to comment regarding cultural resources in the Draft EIR of the "Transportation 2035 Plan".

FIGR members have knowledge of the presence of sacred and cultural resources in the vicinity of many of the roads, bridges and other structures to be considered in the plan. As a "sovereign government" we request a 'government to government' meeting with you to begin consultation and to provide our initial comments on how your initial cultural resources studies, surveys and evaluations should be conducted in accordance with our Tribal Policies and Standards.

NOP 1

Please contact me at the numbers below to set a meeting.

Respectfully,

Nick Tipon
Chairman: Sacred Sites Protection Committee

707 478-1737
ntipon@comcast.net

Fredrick Schermer
139 – 29th Street
San Francisco, CA 94110
vredesf@pacbell.net
fredrick_schermer@dot.ca.gov

To: Ashley Nguyen, EIR Project Manager
Metropolitan Transportation Commission
101 Eighth Street
Oakland, CA 94607

March 8, 2008

Re: Environmental Assessment of the Transportation 2035 Plan

Dear Ms. Nguyen,

Thank you for providing me the opportunity to comment on the T2035 in light of the environmental matters such as air quality, climate change, and land use. Both as an immigrant of the Netherlands (a nation to be swallowed by the rising sea level if we do not counteract our current polluting behavior) and as a planner for Caltrans (though I write this letters as coming from myself), I have an acute sense of land use that may differ from the average Californian. Especially in light of the environment, I am disappointed that MTC's focus is not more fully devoted to transportation system management that delivers the maximum benefits to the above mentioned environmental matters. While prolonged highway congestion is a quick example of how pollution is increased compared to smooth flowing traffic, transit quality lower than needed also contributes to that same more polluting result – though in an indirect way. When transit is not put together the best way possible *for the users*, more people decide to take their private cars instead, leading to more congestion on our highways, and the circle is completed with more air pollution (not to say more time wasted) than necessary.

NOP 2

On paper, MTC seems to be fully devoted to better transportation system management; in the field (and in the T2035), however, this devotion is not as strong. I miss the specific policy that combats the problems of the transportation system as a whole. As a European, I am used to having the governmental results of lower quality, as created by local governmental agencies working their own little niche too much (i.e. balkanization), be resolved by clever governmental guidance one level up (such as by MTC or Caltrans). As a Dutch person, I also tend to say things as I see it (so apologies for the straight talk; otherwise, I am a nice person).

MTC did not step up to the plate when the plan that Muni and Caltrain had in place to create a multi-modal station at Bayshore fell through. By separating this single last stretch on the new T-line, benefits of economies of scale could not be given to the travelers. The plan is now taken up in T2035 as 'vision.' Yet, finishing up a project in two sittings rather than in one costs more, while the benefits are also placed in a distant future. Highway 101 would benefit today from fewer travelers using their private car when they get that better option to switch to transit.

NOP 3

Similarly, the same county line where San Mateo and San Francisco meet, but now on the West side of the San Bruno mountains, is the location where the best possible transit transfer to alleviate private car use on Highways 1 (the much plagued 19th Avenue) and 280 is missing: a MuniMetro rail extension from BART's Daly City station 0.8 miles to connect at 19th Avenue (and SFSU and Stonestown). The county line makes Muni unwilling to provide what is the best overall service for highways 1 and 280 delivering congestion and pollution reductions. MTC has a role to play that it is currently not playing. Excuse me for saying this, but the truth is that for the best results we must all play our specific roles; merely supporting others in their specific roles does not lead to the best results nor is it a specific role in itself.

NOP 4

Other aspects in the Bay Area that keep people choosing their car over transit are:

* The newly planned TransBay Station not having secured the pedestrian tunnel safely connecting them to BART/Muni on Market street. By creating thresholds that are vital to the transit experience, more people will not use these very costly transportation products. Imagine a San Franciscan living West or Southwest of this rail station with luggage, wanting to take this rail connection, transferring to BART or Muni. By having to haul the luggage across the streets of San Francisco, a less pampered situation is created that will entice this person to use the private car. Once this image is in someone's head, they'll take the car next time. The 40 million dollars are small potatoes in light of the overall cost, and the cost becomes prohibitive when put in place not immediately but at a later point in time.

NOP 5

* BART and Amtrak have an excellent location where they cross each other's path: in West-Oakland. Yet at this prime location nothing is happening. A new BART station a minute ride West of the 'West-Oakland' BART station (I would suggest the name 'San Francisco Bay Station' for this transfer point) could enhance both BART and especially Amtrak. Currently, people in San Francisco need to take a bus to Emeryville or take BART to its fringes to get to Amtrak – and that is too much trouble for a lot of people (me included). Such 'San Francisco Bay Station' would also be a good location for the High Speed Rail for it is the heart of the BART (all trains stop here), covering the largest potential in passengers as possible with the highest tier of local transit, while it is still closer to the Embarcadero Station (5'00") than Oakland's City Center Station (5'30").

NOP 6

Other aspects MTC should be looking into from a cost efficiency perspective:

* Overzealous belief in competition. Through MTC, local transit agencies are given money to compete with one another. AC Transit's Bay service and BART competing to provide same/similar service takes money away from other transit projects/operations. In another example, Samtrans going all the way through San Francisco is a costly affair, not making much sense from a financial perspective when this service is already provided by BART, Caltrain and Muni. Various transit agencies in the Bay Area perform at lower than 20% fare box recovery rate. Don't pay 80 cents to every dollar so they can compete with each other! Though I do not mind different local transit agencies, the only thing that should matter for MTC is the user's experience and the wisest use of available funds. That is why MTC has such an important role to play – overcoming the downsides of balkanization that do not help anyone or the environment.

NOP 7

The idea that Europeans spend more money on transit than we do in the Bay Area is according to me a false perspective. The cost perspective of an integrated high-quality transit system is two-fold: building it is often quite expensive, but operating it is quite 'inexpensive,' not just because more people are attracted to using it, but because it is manned by a lot less personnel. The expensive investments are made here just as well, but they tend to be ad hoc investments that are not considered the best from a systematic approach, which then lead to higher costs operating the lines that still leave people desiring for their private cars. For Americans, both the part of the individual expenditure (of 18%) and the part of the BNP (of 22%) for transportation is higher than the transportation part for Western-Europeans (of 14%). Put rather strongly, not connecting two systems at their mutually most beneficial spot is an environmental crime. I already mentioned BART and Amtrak in this respect.

NOP 8

Yet another bad point in case of not using economies of scale in transit – of overbuilding transit and then operating it at the incorrect level – is Muni's Market Street tunnel. It was extremely expensive to build, but it is operated as a lower tiered and more expensive LRV-system (not just according to me but also according to V. Vuchic), not as a metro with much better and more reliable service. That way, money is wasted twice: in building something too big, and in operating it in a too small of a way, delivering a product of lower quality. Obviously, MTC has a role to play that it is currently not playing.

NOP 9

Dear Ms. Nguyen, I hope you can read the vigor in my words – I know about good transit. I hope you are not taking the vigor in my words personally, but as the honest questioning about MTC fulfilling its specific role of overcoming the local agencies entrenched jurisdictional positions and self-absorbed interests. The Bay Area transit system is quite disorderly, under-performing yet expensive to operate, and we need MTC to step up to this plate. Though I am pro professional transit, I am also pro private car.

Thank you for the opportunity to have my say about the T2035 and speak up about what I see is a missing policy in professional action.

Best regards,



Fredrick Schermer

Highways: build it and they will come. Transit: build it better and more will come.

223 Donner Avenue
Livermore, CA 94551-4240

17 March 2008

Metropolitan Transportation Commission
101 Eighth Street
Oakland, CA 94607
(attn: Ashley Nguyen, EIR Project Manager)

Re: Transportation 2035:

MTC's Transportation 2035 should disregard and restudy the Regional Rail report. Attached is an NOP 10 updated copy of my 19 Sept. 2007 letter to MTC Commissioners (Attachment A).

A high MTC priority should be to acquire right of way to widen the medians for I-80 to Crockett, SR-4 thru Antioch, and I-580 thru Livermore. Also to plan for widening and total grade separation NOP 11 of two rail corridors: a 4-track peninsula Caltrain and a 2-track future HSR line in the East Bay from Santa Clara to Oakland via Mulford.

The wider freeway medians would allow at-grade BART *trackway* – without the massive earthwork, track structures, new grade separations, or land and environmental impacts of usual BART lines – at NOP 12 a current cost of about \$12.7 million/mile. (This does *not* include stations, cars, land, etc. It *does* include third rail traction power, ductwork, train control, and communications.)

Expanding an integrated BART-based regional rail network per Attachment A in the coming decades would enhance transportation and the Bay Area environment far better (and probably at less cost) than creating a new rail network cluttered with freight trains and grade crossings.

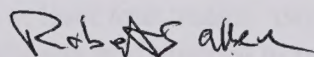
Re: 2009 TIP:

OP 13 Attachments B-F relate to Alameda County's Tri-Valley area. Attachment G is specific to Contra Cost's eBART. I hope that a BART Dublin-Pleasanton intermodal (per Attachments B and C) is incorporated in the 2009 TIP. NOP 14

Two costly transportation projects should be deferred pending further study:

ACCMA's *interim* eastbound I-580 HOV lane. (It should be part of a comprehensive I-580 widening and improvement program) NOP 15

The Union City BART/Capcor Union City intermodal. It should instead be at BART's Coliseum/Oakland Airport station, which serves both the Fremont and Dublin-Pleasanton BART lines and a better East Bay passenger rail route via Mulford. The Mulford line is about 4.3 miles shorter and much straighter, and it has fewer grade crossings with far less traffic than the present route via Centerville and Decoto. NOP 16



Robert S. Allen
BART Director (1974-1988)
(925) 449-1387

cc: Dorothy Dugger, BARTGM

Updated copy of my 19 Sept 07
letter to MTC Commissioners.

223 Donner Avenue
Livermore, CA 94551-4240

~~19 September 2007~~

17 March 2008

MTC Commissioners:

NOP 10
Cont.

Re: Draft Regional Rail Plan

Regional Rail is a splendid concept gone awry. It is based on faulty premises, the worst being that BART outward expansion is nearly complete. Voters in three counties bonded themselves in 1962 to build rail rapid transit. The original BART rail network has had a number of extensions, and each new extension enhances regional mobility. BART now serves four counties, and active plans are underway to add a fifth. The plan as proposed would overlay on BART's fantastically successful passenger operation a duplicative network of freight-gage passenger trains. The plan should consider:

- **The BART Role:**

The plan downplays BART's extension potential. Largely funded by a \$792 million bond issue 45 years ago, BART ran its first 2-car trains between Fremont and Oakland 35 years ago. Today the plan cites BART and Caltrain as "the backbone of the regional rail network. From nothing to the backbone in just 35 years suggests that the BART pattern of growth, both inward and outward, should continue unabated. Don't sell BART short!

- **A New Network?:**

The plan contemplates a patchwork freight-gage network of express trains. While California's planned High Speed Rail will probably be that gage - like Caltrain, ACE, Capitol Corridor, and Amtrak - a costly new infrastructure would be needed in heavily populated areas. BART already has the infrastructure of subway and aerial lines, yards and shops, train control, transit vehicles, and a going system. Outward BART extensions, especially if at grade in freeway medians or along railroad grades, would be relatively low in cost.

- **Safety:**

In 35 years, 29 billion passenger miles, BART has had only one passenger fatality (suicides excepted), and no grade crossing accidents (because it has no grade crossings). May that record continue! As EMU, DMU, or push-mode trains put passengers in a lead car, the risk of passenger injury or death in grade crossing accidents rises. The threat of deliberate acts by mentally ill or suicidal miscreants ought not to be ignored. Scheduled or frequent trains make passenger lines an easier target than lines with only unscheduled freight. Eliminating grade crossings on passenger lines (especially where trains have no locomotive in front) should be a prime goal of regional rail.

Attachment A.

- **Secure ROW:**

A fenced right of way enhances safety. It also allows third rail power, reducing the needed clearance overhead. (BART allows structures at 13 ½' above top of rail, as against 22 ½' ATR over freight rail.) Structures over at-grade third rail transit lines thus cost dramatically less than those over other rail lines. Running transit in a wide freeway median brings the benefits of a secure right of way without the iron curtain effect on communities of a separate at-grade alignment.

- **BART Extensions in Freeway Medians:**

Three very congested freeways in the East Bay cry out for widening, with space for an at-grade BART trainway in the median:

I-80: El Cerrito del Norte to Crockett, aiming for the Carquinez Strait, Vallejo, and the North Bay.

SR-4: Pittsburg to Antioch and SR 160, aiming for the Central Valley, and

I-580: Hacienda to Greenville Rd. in Livermore, also aiming for the Central Valley.

CMIA and other funding to widen these freeways could well help widen the medians to allow low-cost BART trackway (about \$12.5 million/mile) for BART extensions.

\$12.7

- **BART and HOV Lanes:**

Freeway widening could be reduced if BART routes replaced rather than augmented use of median space by HOV lanes. Extending BART in I-580 to Greenville Road or further to the Central Valley, for example, might eliminate the need for HOV lanes.

- **BART MOS to Alum Rock in San Jose:**

Subways are exceedingly costly. Building an MOS (minimum operating segment) at grade on the former WP and over US 101 just to a Santa Clara Street (Alum Rock) link with the planned light rail could yield a highly visible presence in the Silicon Valley and good connections to downtown and Caltrain. This segment would prove the need for the full extension to Santa Clara via an at-grade line alongside Caltrain.

- **PreBART for Lower Cost:**

Where financing for a full BART line is lacking, a BART trackway deferring train control, traction power, and shorter platforms may be the key. Locomotive-powered trains of three or four BART-type cars, modified for the service, could reduce the initial cost and allow easy conversion to full BART at a later time. Particularly with BART planning to replace its fleet in a few years, the existing cars could provide low-cost rolling stock.

- * **Peninsula Rail Corridor:**

High speed rail and more bullet trains to San Francisco will make grade separating the line imperative. It should have at least four tracks: two HSR/Express and two local. Since BART is already at Millbrae and planned to reach Santa Clara, serious consideration should be given to changing the local service to BART: 5 ½' gage, third rail power, high platforms, automatic fare collection with RSS (Remote Station Staffing), etc. Peninsula travelers could really take to frequent BART trains.

- **High Speed Rail:**

California High Speed Rail likely will have a Central Valley spine line to Sacramento and a line via Pacheco Pass to San Jose and San Francisco. It could well assume and convert the Capitol Corridor to a high speed rail line between San Jose, Oakland, and Sacramento. The enhancements could be running via Mulford, a stop at BART's planned Coliseum to Oakland Airport people mover, and an Elmhurst by-pass (west of I-880).

- **Magnolia Intermodal:**

A new BART line could link the Washington Street portal in downtown Oakland with the trans-bay tube. It would bypass the West Oakland station and stop at Magnolia (where the WP used to cross the SP). While somewhat costly, it could defer the need for another tube and provide a superb BART connection for San Francisco to a new high speed rail line to Sacramento. It would also provide an alternative route should a mishap occur on the present BART aerial line in West Oakland.

- **The Altamont:**

The UP/ACE rail line over the Altamont was built for heavy freight trains. To reduce the grade, the line is long and circuitous. Passenger trains – especially electric trains – could have much shorter but steeper grades. (BART routinely runs on 3% grades.) If ACE were electrified, it could run on an alignment miles shorter than the UP. BART might be slightly slower over the Altamont than high speed or even regional rail, but it serves so many more destinations that BART would serve most Central Valley commuters better. BART would lie in the I-580 median to Greenville Road, curve under westbound I-580's elevated lanes, and follow the former SP and Old Altamont Road to Mountain House, then Tracy, then an intermodal station on the HSR spine line near Manteca.

- **Freight:**

Freight trains are very sensitive to grades. Fuel and air pollution concerns plus the need for heavier motive power suggest that most Bay Area freight should go via Martinez and either the A (Sacramento) or B (Mococo) line to the Central Valley. The Mococo line could become so busy with port traffic that it would not be available for passengers.

- **I-780-205:**

An interstate highway link between I-780 at Benicia and I-205 at I-580 west of Tracy would greatly relieve traffic congestion and grades like Dublin Hill and the Altamont. Like the UP Mococo line, it would be at water level, basically following SR-4 through Pittsburg and Antioch, then swinging southerly to west of Tracy and the I-5 route to southern California. The new portion should have a wide median that would accommodate a BART line to Tracy.

- **Northwest San Francisco:**

A BART subway from Civic Center along Oak and Masonic toward the Golden Gate might be a good way to serve the North Bay. Possibly BART could go over the bridge to Marin County. If not, it could at least serve an intermodal near the south end of the bridge and relieve traffic congestion to downtown. An early stage would be just a spur up Oak Street, helping BART East Bay trains better serve all the downtown SF stations should a mishap strike the Mission line:

My vision of passenger rail: mostly either HSR or at BART gage on secure, grade-separated trainway, apart from freight rail, I have repeatedly asked the regional rail partners and others to consider most of these and other possibilities. Rarely do I get an acknowledgement or even a phone call, let alone a serious discussion.

I don't claim to be an expert, though I worked most of my life in railroad engineering and operations on three major railroads (all now UP subsidiaries) and am a life member of AREMA (American Railway Engineering and Maintenance of Way Association) , a member of AREMA Committees 12 (Rail Transit) and 17 (High Speed Rail) and a former member of Committee 16 (then Economics of Railway Location and Operation.)

I urge you to send this plan back for further study and solicit public input early on. The duplicative passenger rail network proposed is **not** in the region's best interest

Robert S. Allen
BART Director (1974-1988)
(925) 449-1387

223 Donner Avenue
Livermore, CA 94551-4240

NOP 13
Cont.

4 March 2008

Linda Sailors –

One year ago -- just after CTC approved Prop 1B CMIA funding for I-580 – I sent the attached to BART Directors, MTC, and others. It is a low-cost way for Livermore and Central Valley buses better to access the Dublin-Pleasanton BART station. Nobody showed any interest – not even a phone call!

The bus stops now are far away and mostly out of sight from the station entrance. LAVTA #12 (via I-580) and #10 (via Pleasanton and Stanley Blvd.) stops are far apart on opposite sides of I-580, forcing a difficult choice on patrons bound for downtown Livermore.

The plan I proposed used city streets. Planned HOV lanes to Hacienda with bus ramps accessing the station would yield even more benefits, e.g., eliminating bus weaves across four lanes of busy freeway; shorter running time.

A bus-only ramp from the westbound HOV lane could well bring buses directly into the station, with passenger discharge near the station entrance. Buses could then go northerly along the road to the turnaround and back to one of the new bus berths.

Eastbound is more difficult. I-580 traffic lanes west of Hacienda could be shifted southerly, allowing a new bus entry to an eastbound median HOV lane.

Since HOV lanes in both directions are planned between Hacienda and Greenville, these bus access ramps should fit beautifully, enhance bus safety, and slash travel times. They should be planned immediately as part of the HOV lane project(s).

BART's long-range goal, of course, should be to get the I-580 median widened enough for BART rail to stations at Isabel, the truck scales, and ACE ^{road} north of I-580, aiming to the Central Valley (along the former SP and Old Altamont Pass toward Mountain House, Tracy, and a high speed rail intermodal station near Lathrop or Manteca.

Bob Allen
449-1387

Attachment B

223 Donner Avenue
Livermore, CA 94551-4240

NOP 13
Cont.

3 March 2007

BART Directors:

RE: Improved Bus Access, Dublin-Pleasanton Station

Please add southbound bus berths on the busway that runs under I-580, as shown on the attached aerial photo. They would serve Livermore and Central Valley buses reaching the station via I-580. Buses would enter the station from I-580 via Hacienda Drive and Dublin Blvd. They would exit via Owens Drive and Hacienda Drive.

It appears that about 10 bus berths would fit alongside the Iron Horse Trail just north of the station entrance. Unlike most of the existing bus berths, these would be visible from and close to the station entrance, with no traffic lanes for patrons to cross.

The two or three berths closest to the station entrance should be reserved for an I-580 link with Livermore - by far the largest city in Alameda County with no BART rail. Buses using them should feature closely-timed meets with every train - at least during commute hours. They would provide quasi-BART service to BART's future West Livermore Station site on Airway Blvd. (Caltrans, as part of the Isabel/I-580 interchange project, plans to move their Portola Park-Ride to this future BART station site.)

If LAVTA ("Wheels") continues to stall on such a link please consider other options. LAVTA's planned "Rapid Bus"- although it may otherwise be well justified - just would not serve this market.

These berths could make the bus-train transfer nearly seamless. Giving BART patrons better bus access would reduce parking hassles, ramp meter delays, "cut-thru" traffic in Pleasanton, and congestion on I-580 and Stanley Blvd. By reducing the need to drive to BART, they could reduce air pollution and make a BART commute a smart commute. Who would drive when the bus is so convenient?

I hope that you will get them in your capital improvement program and aggressively seek the necessary funding.

Attachment C

Robert S. Allen
BART Director (1974-1988)
(925) 449-1387

Cc: Carter Mau
MTC
ACCMA
Caltrans 04
BAAQMD
LAVTA

Dublin

Map

Sa

Transportation 2035 Plan Draft - Environment & Heritage Branch

To Haywards

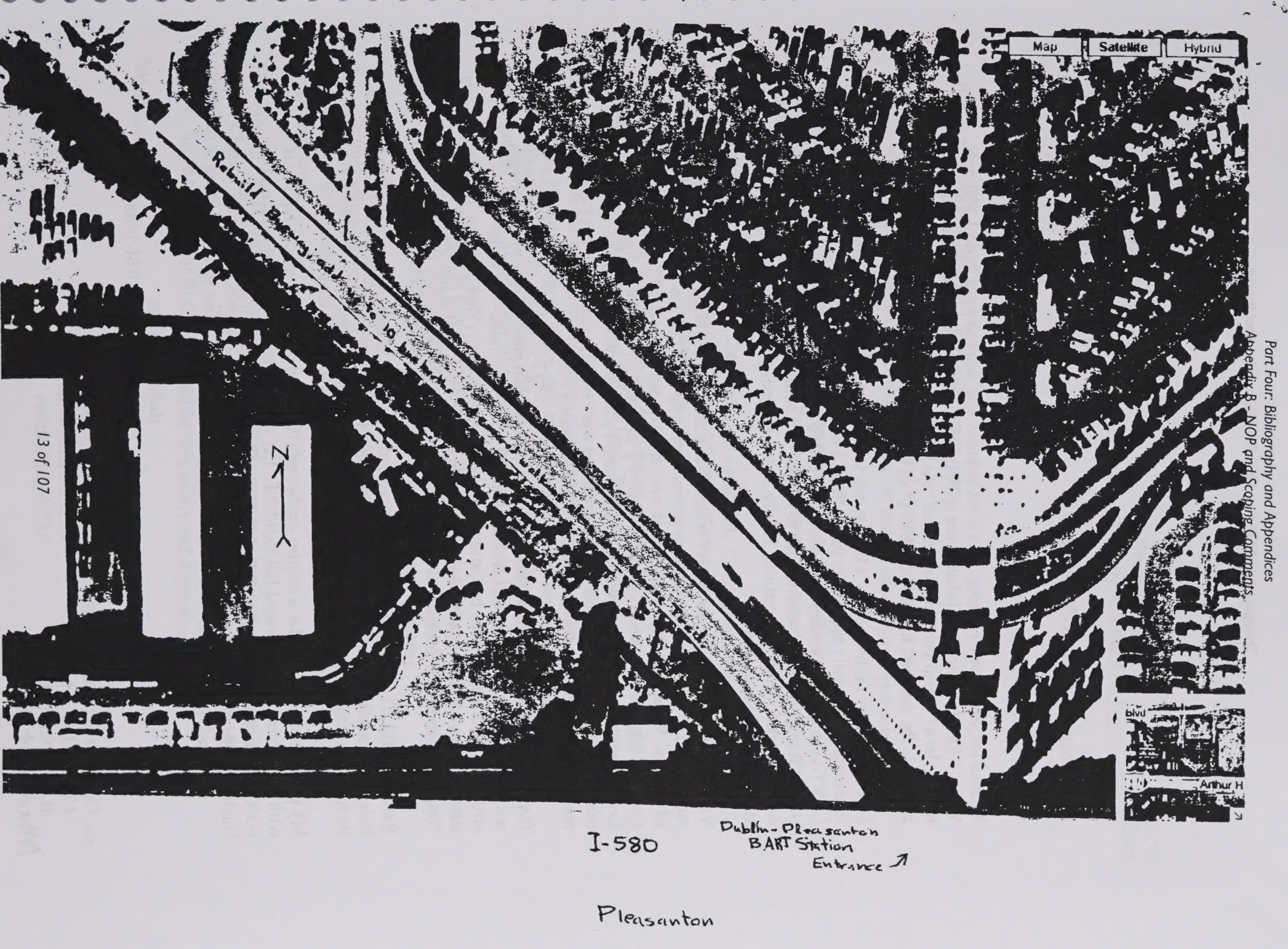
200 of 197

To Limerick

Pleasanton

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223 Donner Avenue
Livermore, CA 94551-4240

NOP 13
Cont.

18 April 2007

Scott Haggerty, Chair, ACCMA

Re: I-580 Highway Improvements

Thanks for your April 11 letter. It's great to know that you too want to do I-580 right. When ACCMA's Beth Walukas wrote the City of Livermore February 26 asking that the median be a "transit corridor" instead of "BART", and you want to begin environmental clearance for "transit" instead of "BART" in the median, it makes one wonder.

Livermore is by far the county's largest city with no BART rail – not even good bus connections. I greatly appreciate your efforts a few years ago (tabled on a 3-3 vote at LAVTA) to get seed money for a direct bus tied to commute hour trains. LAVTA's costly "Rapid Bus" can't come close to the 16"-19" scheduled run time between BART's Airway Park/Ride and the station. If only there had been one more yes vote! Or if they at least would reconsider.

Years ago when I was on the BART board, Pleasanton wanted BART in the freeway median and Livermore wanted it downtown. I came up with the concept of BART along El Charro. When the City of Livermore switched and asked for BART along I-580, I jumped for joy. The freeway was obviously a far better choice, the former downtown Livermore station site disappeared, BART bought sites for two stations and a yard site near Greenville Road, and freeway interchanges were rebuilt to allow a BART-usable median. The public has invested much in BART along I-580.

BART ballasted double track trackway (track, power, train control, ductwork, barriers, etc.) at grade in a freeway median costs about \$12.7 million/mile – far under the erroneous figure often cited by those who should know better. (That does not include stations, cars, earthwork, structures, special trackwork, land, related roadwork, or "implementation". It is based on old BART cost data in current dollars.)

Extending BART at least to West Livermore and later to ACE east of Greenville Road is indeed a cost-effective way to relieve congestion on I-580. Any work along I-580 should include protecting the right of way to make possible a wide median.

My concern about ACCMA's interim eastbound HOV lane is that the cost to replace it with the permanent lane would fall to BART. Let's just forget the interim work and do I-580 right from the start. Get the right of way for HOV lanes both ways between Hacienda Drive and Greenville Road plus median space for BART.

Robert S. Allen
BART Director (1974-1988)
(925) 449-1387

cc: Governor Schwarzenegger
Caltrans District 4
BART Directors

CTC Commissioners
MTC Commissioners
ACCMA Directors

Attachment D

NOP 13
Cont.

223 Donner Avenue
Livermore, CA 94551-4240

13 April 2007

The Honorable Zoyd Luce
Director, BART District 5

Re: Comparison of West Livermore Station Sites

My April 10 letter to you discussed BART rail to Livermore. Here's a brief list of reasons why BART should stay in a widened median instead of angling over toward Stanley Blvd via El Charro:

A BART line along the freeway could be easily extended to Greenville Road in a widened I-580 median with no costly earthwork and structure to enter or leave the median.

Westbound I-580 east of Greenville Road is on a high fill. Curving under the fill and up to the former SP rail roadbed would involve only a short tunnel section. Otherwise there would be no major earth or structure work.

While heavy earthwork would be needed for a station and yard in the very wide right-of-way east of Greenville, there would be little haul. Borrow or waste could be done on site.

BART would be poised for easy extension along the former SP and Old Altamont Pass Road toward Mountain House, Tracy, and an intermodal station on the future HSR LA to Sacramento spine line. (While the I-580 grades are too steep, the railroads were built for gentle grades; BART could easily take this more direct route to Tracy.)

When BART is extended to East Livermore near the truck scales, the site BART owns for a yard could be used for overflow parking until BART is extended to an ACE intermodal facility with a massive parking structure having direct I-580 freeway access.

There is much to recommend a BART-ACE intermodal connection. But ACE runs only four trains each way *per day* as against four BART trains *per hour*. Delaying that connectivity a little while until BART is extended onto the former SP should not be of over-riding concern.

The cities of Pleasanton and Livermore are actively pursuing development south of I-580 near El Charro. Pleasanton plans on extending El Charro to Stanley Blvd. soon. BART other than at grade would be prohibitively expensive, but at grade it would chop up land parcels. Right of way near El Charro could be very costly and disruptive.

Attachment E

Running BART alongside the railroad would bar rail freight service to potential industry. Rail service potential plus easy freeway access via El Charro could make land in that area very costly.

Patron access to a BART station north of the UP and west of Isabel would be very poor, especially if BART had tail tracks beyond the station. Patrons from Livermore would almost have to come via very congested Stanley Blvd. and the "jug-handle". They would congest a short distance of the new SR 84 thoroughfare before going west to the station. By contrast, a West Livermore station by I-580 could have excellent access to the freeway and all of Livermore.

While ALUC (Airport Land Use Commission) concerns would constrict development around a freeway-oriented West Livermore station, there would be very limited possibility of any sort of development near a railroad-oriented station. Plans for a "Chain of Lakes", further gravel extraction, poor access, and the area's desire for a green belt make TOD near such a station inconceivable.

The City of Livermore long ago decided that BART should follow I-580, not the railroad, through Livermore. The station site once planned for BART (Stanley/Murrieta/Fenton) is no longer available. Any extension along the railroad would be prohibitively costly.

With CTC's CMIA decision funding three major projects along I-580 (and CMIA is less than ¼ of Prop.1B), it appears that there will be ample funding to widen I-580 enough for BART at grade in the median. Deferring ACCMA's *interim* eastbound HOV lane project and doing a coordinated project on I-580 makes so much sense!

This week's "Transportation Summit" in Dublin suggests that more Federal money may come through the House Subcommittee on Highways and Transit. Things are looking up!

Robert S. Allen
BART Director (1974-1988)
(925) 449-1387

223 Donner Avenue
Livermore, CA 94551-4240

NOP 13
Cont.

10 April 2007

The Honorable Zoyd Luce
Director, BART District 5

Re: BART rail to Livermore

History:

Early LPX (Livermore-Pleasanton Extension) plans showed BART along the railroads through downtown Pleasanton and Livermore. MTC funds bought the 11-acre brickyard site at Stanley/Fenton/Murrieta with transit funds for a future BART station.

Pleasanton later opted for LPX along I-580. With Livermore still wanting BART downtown, I conceived an El Charro alignment to meet the desires of both cities.

Livermore later requested that BART follow I-580 instead of the railroad. Clearing with MTC, they allowed development of the brickyard site that precludes its use as a BART station. With both cities asking that BART rail follow I-580, I encouraged BART to buy the 53-acre Gandolfo property for a West Livermore station site. My intent was to clear the way also for an I-580/SR-84 interchange – which project is now funded.

My successor brought BART rail to Dublin-Pleasanton and got BART to buy sites in East Livermore for another station and yard. She also arranged for a park-ride at West Livermore, which gets little use due to the poor bus link to the Dublin-Pleasanton BART station. Structures allowing a wider median that will accommodate BART and HOV lanes have been built at Tassajara Road and Airway Blvd. The public has invested a substantial sum to allow BART in the I-580 corridor as the cities of Livermore and Pleasanton requested.

I-580 phasing:

An early phase of getting BART to Livermore (by far the largest city in Alameda County with no BART rail) should be assuring an I-580 median wide enough for BART from Hacienda Drive to Greenville Road. Getting ACCMA to defer their *interim* eastbound HOV lane, now that CMIA and other Prop. 1B funding for a comprehensive I-580 rebuild looks certain, is critical. Adding southbound bus berths at the D-P BART station along the Iron Horse Trail north of the freeway – close to and visible from the station entrance – would enhance intermodal connectivity. LAVTA or another operator should be encouraged to operate a link between the West Livermore park/ride and each BART train, at least during commute hours (say, 6-10am and 3-7 pm). Three buses running a total of 25 hours per day would do the trick. At LAVTA's marginal cost of \$37/hour, they should cost about \$238,000/year, most or all of which should come from fares.

Feb 2008
now \$51.23/hour,
\$327,000/year
RSD

Attachment F

The next phase should involve working with Caltrans and ACCMA to widen the I-580 median from Hacienda Drive roughly to Portola Avenue – under 6 miles. This would allow BART to run *at grade* (at a trackway cost of about \$12.5 million/mile including ballasted double track, traction power, train control, ductwork and fencing/barriers) one station to West Livermore with tail tracks.

Later phases would take BART rail to East Livermore (near the truck scales) and Greenville Road still in the I-580 median. East of Greenville Road it would curve left under the high westbound I-580 lanes and rise to the former SP Tracy line roadbed, an ACE/HSR intermodal station, and yard/shop built to allow future extension to Mountain House, Tracy, and an intermodal station on the HSR LA-Sacramento spine line.

West of Greenville Road there would be almost no earth or structural work required, once a suitable median strip is reserved. Trackway should cost about \$12.5 million/mile.

El Charro problems

BART planners have resurrected an El Charro alignment to near Isabel. Although I once championed it to solve a specific problem (see above), it has a number of problems. It requires a flyover or tunnel at substantial cost to leave the I-580 median. The high cost of going through downtown Livermore means it will be forever truncated. Patronage would suffer due to very poor access to the station. Land near the proposed station site does not lend itself to development. The line would complicate Pleasanton's plans to extend El Charro Road to Stanley Blvd. Right of way could prove costly.

A direct ACE connection would have limited value, since ACE runs only four trains each way each day. Even then, a far better ACE connection would be at the foot of the Altamont, where an intermodal station would also intercept buses and motorists coming over the pass. With the likelihood of better funding for I-580 work under Prop. 1B, a wide median for BART in I-580 to Greenville Road could let BART reach such an intermodal at very reasonable cost. I-580 is by far a better choice than El Charro.

Robert S. Allen
BART Director (1974-1988)
Retired, SPT Engineering/Operations
Life Member, AREMA (American Railway
__Engineering and Maintenance of Way
__Association)
Member, AREMA Committee 12 (Rail Transit)
Member, AREMA Committee 17 (High Speed Rail)
Former member, AREMA Committee 16 (then
Economics of Railway Location and Operation)
(925) 449-1387

223 Donner Avenue
Livermore, CA 94551-4240

NOP 14
Cont.

14 March 2008

BART Planning Department
Attn: Katie Balk
300 Lakeside Drive
Oakland, CA 94612

Re: Phase I eBART Extension Scoping

Extending eBART in a widened SR 4 median thru Antioch makes worlds of sense. Costly elements of classic BART alignments (e.g., massive earthwork, costly track structures and grade separations, land and environmental issues) are averted. With no grade crossings, the secure route allows easy upgrading to classic BART.

The guideway should be BART gage (5' 6"). (Early plans to go standard - 4' 8 1/2" - gage onto the Mococo line appear dead.) BART gage would allow regular BART work equipment to maintain the track. Scavenged BART cars and locomotives could be used for pre-BART service. Platform geometry would need no change in the upgrade.

Crossties should be outfitted to allow quick installation of power pickup third rail, and provision made for adding train control quickly.

Right of way should be wide enough for double track, station platforms, and a third middle track extending several train lengths at each end of the platforms. This would let each station serve as a transfer, and allow tail track and runaround for each mode beyond the station.

Quite likely it would be worth making the entire extension classic BART, eliminating the need for the transfer facility, other transfer trackage, and a separate shop and fueling facility. There would be no need for a separate operation.

Patronage should be substantially higher if the entire line were classic BART, due to the shorter trip times and lessened hassle.

I would also suggest adding a Los Medanos/Century Blvd. station. Publicly-owned land once planned for a freeway interchange there could be converted to parking by commuters from Antioch who otherwise would have to travel out of direction to the Hillcrest station and vie for space with those from other East County communities.

Attachment 6

Robert S. Allen
BART Director (1974-1988).
(925) 449-1387



Making San Francisco Bay Better

March 18, 2008

Ashley Nguyen
Project Manager
Metropolitan Transportation Commission
101 Eighth Street
Oakland, California 94607-4700

SUBJECT: Notice of Preparation of a Draft Environmental Impact Report for the Transportation 2035 Plan (NOP)

Dear Ms. Nguyen:

Thank you for the opportunity to comment on the Notice of Preparation (NOP) of the Draft Environmental Impact Report for the Transportation 2035 Plan. The San Francisco Bay Conservation and Development Commission (BCDC or Commission) has not reviewed the NOP, but the following staff comments are based on the *San Francisco Bay Plan* (Bay Plan) as amended through November 2007, the McAteer-Petris Act, and staff review of the NOP.

Jurisdiction. BCDC jurisdiction includes Bay waters up to the shoreline, and the land area between the shoreline and the line 100 feet upland and parallel to the shoreline, which is defined as the Commission's 100-foot "shoreline band" jurisdiction. The shoreline is located at the mean high tide line, except in marsh areas, where the shoreline is located at five feet above mean sea level. An essential part of BCDC's regulatory framework is the Commission's Bay Plan. The Bay Plan includes findings and policies that direct the Commission's review of proposed projects and priority land use designations for certain areas around the Bay to ensure that sufficient areas around the Bay are reserved for important water-oriented uses such as ports, water-related industry, parks, and wildlife areas. The most relevant findings and policies for the NOP are the Bay Plan's transportation findings and policies.

NOP 17

Bay Fill, Public Access and Sea Level Rise. As the NOP is for a program EIR the comments in this letter will refer to the broader intent of the 2035 Plan and not to the specific projects that may be contained within the Plan. This letter should not be considered an endorsement of individual projects, which will be reviewed separately for conformance with the Commission's laws and policies. Briefly, projects proposed within the Commission's jurisdiction should avoid all unnecessary fill in the Bay, include maximum feasible public access consistent with the project and consider the effects of future sea level rise on location and design of projects. The projects will be reviewed for consistency with the Commission's Bay Plan and the Bay Plan's transportation policies, which stress the importance of alternative forms of transportation to the single-occupant vehicle, and the need for non-motorized access to accompany new transportation projects. Also, the transportation findings state, in part, that roads are not water-oriented uses and, therefore, cannot be permitted on fill in the Bay.

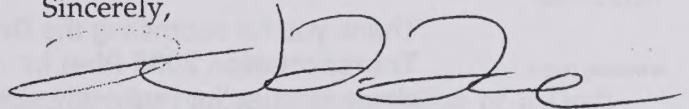
NOP 18

Ashley Nguyen
March 18, 2008
Page 2

Comments on the NOP for the 2035 Plan. BCDC staff strongly supports the direction of the 2035 Plan and has appreciated the opportunity that MTC has provided its regional partners to help in shaping the plan. The inclusion of performance measures and ambitious regional goals is critical to moving the region toward a more equitable and environmentally and fiscally sustainable transportation system and one that seriously attempts to meet the state requirements on green house gas emissions set forth in Assembly Bill 32. We look forward to working with MTC and our other regional and local partners to develop a 2035 Plan that will achieve these goals and support the leadership that MTC has shown in conceptualizing the 2035 Plan.

If you have any questions regarding this letter, or any other matter, please contact me by phone at 415-352-3642 or email lindyl@bcdca.gov.

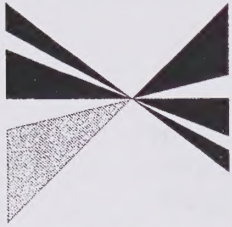
Sincerely,

A handwritten signature in black ink, appearing to read 'Lindy L. Lowe', with a stylized flourish at the end.

LINDY L. LOWE
Senior Planner

LL/emc

SOUTHERN CALIFORNIA



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Alan D. Wapner, Ontario

March 19, 2008

Ms. Ashley Nguyen, EIR Project Manager
101 Eighth Street
Oakland, CA 94607

**RE: SCAG Clearinghouse No. I 20080104 Draft Environmental Report for
the Transportation 2035 Plan**

Dear Ms. Nguyen:

Thank you for submitting the **Draft Environmental Report for the Transportation 2035 Plan** for review and comment. As areawide clearinghouse for regionally significant projects, SCAG reviews the consistency of local plans, projects and programs with regional plans. This activity is based on SCAG's responsibilities as a regional planning organization pursuant to state and federal laws and regulations. Guidance provided by these reviews is intended to assist local agencies and project sponsors to take actions that contribute to the attainment of regional goals and policies.

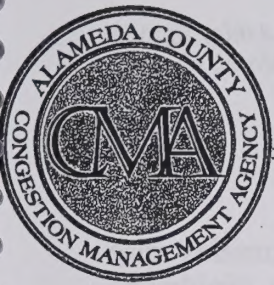
We have reviewed the **Draft Environmental Report for the Transportation 2035 Plan**, and have determined that the proposed Project is not regionally significant per SCAG Intergovernmental Review (IGR) Criteria and California Environmental Quality Act (CEQA) Guidelines (Section 15206). Therefore, the proposed Project does not warrant comments at this time. Should there be a change in the scope of the proposed Project, we would appreciate the opportunity to review and comment at that time.

A description of the proposed Project was published in SCAG's **February 16-29, 2008 Intergovernmental Review Clearinghouse Report** for public review and comment.

The project title and SCAG Clearinghouse number should be used in all correspondence with SCAG concerning this Project. Correspondence should be sent to the attention of the Clearinghouse Coordinator. If you have any questions, please contact me at (213) 236-1857. Thank you.

Sincerely,

LAVERNE JONES, Planning Technician
Program Development and Evaluation Division



ALAMEDA COUNTY
CONGESTION MANAGEMENT AGENCY

1333 BROADWAY, SUITE 220 • OAKLAND, CA 94612 • PHONE: (510) 836-2560 • FAX: (510) 836-2185
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AC Transit
Director
Greg Harper

Alameda County
Supervisors
Nate Miley
Scott Haggerty
Chair

City of Alameda
Mayor
Beverly Johnson

City of Albany
Councilmember
Farid Javandel

BART
Director
Thomas Blalock

City of Berkeley
Councilmember
Kris Worthington

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Jennifer Hosterman

City of San Leandro
Councilmember
Joyce R. Starosclak

City of Union City
Mayor
Mark Green
Vice Chair

Executive Director
Dennis R. Fay

March 19, 2008

Ms. Ashley Nguyen, Project Manager
Metropolitan Transportation Commission
101 Eighth Street
Oakland, CA 94607-4700

Subject: Environmental Impact Report for the Transportation 2035 Plan

Dear Ms. Nguyen:

Thank you for the opportunity to comment on the Notice of Preparation of a Draft Environmental Impact Report for the Transportation 2035 Plan. The purpose of the program-level EIR is to allow MTC to look at the broad, regional impacts of the program of projects/programs in the 2009 update to the Regional Transportation Plan (RTP) prior to adopting the RTP, known as Transportation 2035, in March 2009. The RTP is a long-range comprehensive blueprint for the development of mass transit, highway, railroad, bicycle and pedestrian facilities, goods movement, and airport and seaport. The RTP is updated every four years. Transportation 2035 will be a program of related actions designed to coordinate and manage future transportation improvements among the counties/cities and transportation agencies operating within the nine-county Bay Area.

The ACCMA respectfully submits the following comments, which should be addressed in the DEIR:

- The various Alternatives proposed should analyze realistic inputs and assumptions in addition to analyzing what needs to be achieved to meet the NOP 21 targets adopted by the Commission. This applies to land use assumptions, which in addition to an aggressive development scenario, should be based on the latest Projections as required by state law.
- The assumptions for the quantitative and qualitative analyses of the various projects and programs should be carefully reviewed to ensure that the VMT NOP 22 calculations result in realistic reductions.
- The NOP states that "to qualify for state or federal surface transportation funding, all Bay Area transportation projects – whether for transit, highways, local streets, railroads, or bicycle/pedestrian facilities – must be included in the financially constrained plan. In addition, the plan may also identify illustrative NOP 23

projects that may be funded in the future should funding opportunities arise through legislative or voter actions; these projects/programs would be identified in the unconstrained portion of the plan." On March 5th, 2008, the ACCMA transmitted our Board adopted financially constrained and unconstrained Investment Plan listing the projects and programs that should be included in the RTP update. These projects and programs reflect Alameda County's priorities and need to be included in Transportation 2035 and analyzed in the DEIR.

NOP 24

- Please provide clarification on whether voter approved county sales tax measures were assumed to continue to 2035. The NOP states that this is the case.

NOP 25

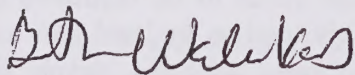
- The Alternatives analyzed should clearly document the level of transportation dollars that are expected in the next 25 years versus the needs to show the disparity between resources and needs. The DEIR should also clearly document eligibility criteria for the various fund sources and tie it to the projects and programs being proposed, so that it is obvious that what is proposed in the financially constrained alternative is indeed fundable.

NOP 26

- The DEIR should include a discussion of how commitments to regional programs have changed from previous RTPs and what the impact is. This is particularly important for maintenance and rehabilitation of the existing system.

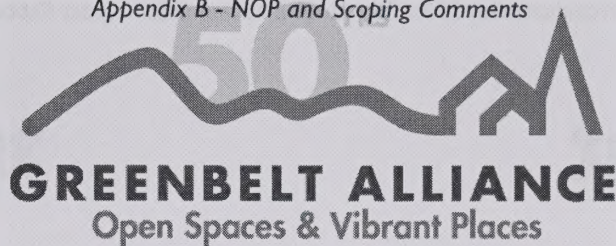
Thank you for the opportunity to comment on the Notice of Preparation of a Draft Environmental Impact Report for the Transportation 2035 Plan. Please do not hesitate to contact me at 510/350-2326 or bwalukas@accma.ca.gov if you have any questions.

Sincerely,



Beth Walukas
Manager of Planning

Cc: Dennis Fay, Executive Director
Jean Hart, Project Manager
Diane Stark, Senior Transportation Planner
Chron
File: 2008 CWTP – Staff Reports & General
File: 2007-08 Environmental Review Opinions and Responses



March 20, 2008

Ashley Nguyen, EIR Project Manager.
Metropolitan Transportation Commission
101 Eighth Street
Oakland, CA 94607

Re: Comments on the Scope of the Transportation 2035 Plan EIR

Dear Ms. Nguyen:

Greenbelt Alliance is the Bay Area's advocate for open spaces and vibrant places since 1958. We appreciate this opportunity to comment on the scope of the environmental analysis for the Transportation 2035 Plan.

We applaud MTC for taking a "Three E's" approach to the Transportation 2035 Plan, and for setting specific goals and performance objectives for each of the "Three E's." Only by establishing objectives and measuring progress toward our goals can we hope to achieve our shared vision for a more efficient, equitable, and environmentally sustainable region.

Accordingly, **we ask that the EIR rigorously analyze the effects of the alternatives on MTC's performance objectives, including greenhouse gas reduction.**

NOP 27

As MTC's models clearly show, it is impossible to meet our "Three E's" targets through infrastructure investment alone. Land-use strategies must play a key role in achieving our goals.

For this reason **we ask that the EIR study an alternative that includes significantly more focused growth**, such as higher density development scenarios created by ABAG.

NOP 28

With the development of the Air Resources Board's Scoping Plan for AB32 implementation, it is possible that options for pursuing regional goals and objectives that were not previously available may become available in the near future. These could include implementing an Indirect Source Rule review on new development, authority to reject development proposals that exceed a given greenhouse gas emission threshold, or authority to levy new fees and taxes to provide increased funding to land-use programs. Greenbelt Alliance urges MTC to include all options for meeting our regional goals and study bold alternatives in the EIR.

NOP 29

Sincerely,

Stephanie Reyes

Stephanie Reyes, Senior Policy Advocate

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25 of 107
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March 20, 2008

Steve Heminger, Executive Director
Metropolitan Transportation Commission
101 Eighth Street
Oakland, CA 94607
(Submitted electronically)

Re: Scoping for 2009 RTP EIR

Dear Mr. Heminger:

After reviewing the Notice of Preparation and the Project Description & Scope of Environmental Analysis for the 2009 Regional Transportation Plan (RTP) Urban Habitat recommends the following issues of concern be examined in the 2035 EIR:

1. Transportation:

NOP 30

- In order to reasonably evaluate the environmental justice dimension of regional transportation funding, please document the amounts of discretionary transit funding (Federal and State) that MTC has direct control over. Given that in the 2030 RTP MTC asserted that it provides more generous levels of transit funding versus highway funding please provide an analysis of the last 20 years of total funding for highway versus transit funding including breakdowns of bus versus rail funding and by community of concern.

NOP 31

- In addition to the analysis requested above, each RTP alternative should compare the level of transit service by transit operator (as well as bus versus rail) in each county. The estimated cost per rider for each alternative should also be calculated.

NOP 32

- Alternative 3 "Pricing Concepts" will evaluate a range of congestion pricing mechanisms. To meaningfully gauge the equity impact of the respective concepts each pricing mechanism should be evaluated by Community of Concern and income quintile. Wherever possible the benefits for bus riders versus rail or other mode should be evaluated.

NOP 33

- Alternative 4 "Non-Pricing Concepts" should evaluate the equity impact of each concept by Community of Concern and income quintile. Wherever possible the benefits for bus riders versus rail or other mode should be evaluated.

NOP 34

- Under CEQA, the EIR is required to study all feasible alternatives. Alternatives, such as the TRANSDEF proposal, should be evaluated and in



particular for their relative equity impacts by Communities of Concern, income quintile and/or by benefits to bus riders versus rail or other modes.

2. Public Participation:

- Please provide examples and related documentation of how public involvement (whether through the Minority Citizens Advisory Council or other bodies) in MTC activities has altered the outcome of an MTC decision or recommendation for a transportation project or program of relatively significant scale.

3. Air Quality:

- In evaluating the air quality impact of each RTP alternative we request that Communities of Concern be evaluated at their respective geographic unit (census tract) as opposed to having the air quality impact be based on an aggregated figure for all Communities of Concern.

4. Housing and Social Environment:

- An analysis should be conducted of the potential displacement resulting from the respective Land Use alternatives. This should also factor in the RTP's stated affordability target of a 10% reduction in combined housing and transportation costs and how each alternative performs against this measure.

We look forward to seeing how the above elements will be addressed in the 2035 RTP EIR in order to best meet the transportation and housing needs of low income communities, communities of color and the transit dependent in the Bay Area.

Sincerely,

Bob Allen,
Director of Transportation and Housing Programs

March 20, 2008

Steve Heminger, Executive Director
Metropolitan Transportation Commission
101 Eighth Street
Oakland, CA 94607

Re: Scoping for 2009 RTP EIR

Dear Steve:

On behalf of the 110 member and affiliate groups of the Transportation and Land Use Coalition, I am pleased to provide these brief comments on the scoping for the 2009 Regional Transportation Plan (RTP).

Let me begin by offering strong support for MTC's current RTP approach. It has included a bold challenge to a planning framework that no longer was able to confront the major challenges facing our region, and our planet. We are now entering a critical phase where we can take some of the great ideas, goals, and planning frameworks and turn them into real change in investment and policy.

NOP 38

TALC's primary comment on the NOP reflects many of those put forward in TRANSDEF's comment letter. In particular, it is critical to do apply pricing as a sub alternative, or sensitivity analysis, to the other alternatives. While it is possible to keep one alternative whose projects and programs would be optimized to work with new pricing regimes, it is unlikely that those at the same projects and programs that would be in the "project alternative".

Having smart land-use and better pricing as separate alternatives makes it impossible to isolate which changes from the Proposed Project actually produces the results. For that reason the different alternatives should be defined solely as different lists of investments -- combinations of projects and programs. TRANSDEF's letter does point out that this would involve some additional model runs, but it would better help decision-makers decide which pricing and land use interventions are likely to have the greatest impact under a range of investment alternatives.

Feel free to contact me at 510-740-3150 ext. 311 or stuart@transcoalition.org.

Sincerely,

Stuart Cohen
Executive Director

Transportation Solutions Defense and Education Fund

P.O. Box 151439 San Rafael, CA 94915 415-460-5260

March 20, 2008
By E-Mail

Steve Heminger, Executive Director
Metropolitan Transportation Commission
101 Eighth Street
Oakland, CA 94607

Re: Scoping for 2009 RTP EIR

Dear Steve:

On behalf of TRANSDEF, I would like to thank you for the forward-thinking comments you made at last Friday's Planning Committee. It is in that spirit that we offer the following comments on scoping the EIR for the next RTP.

TRANSDEF is pleased to have collaborated with MTC staff in presenting an RTP alternative in the 2005 RTP EIR. We believe it demonstrated important principles--principles which are now being implemented in the new RTP. We seek to provide further food for thought for policy makers with the following proposed additions to the scope of the EIR:

CEQA Analysis of GHG Emissions

After attending the Attorney General's seminar on CEQA and Climate Change today, it is clear MTC needs guidance on how to analyze GHG emissions. Until revised Guidelines are issued by OPR or new regulations are issued by ARB, perhaps the best interim guidance comes from CAPCOA. It is a white paper entitled "CEQA and Climate Change." It is available at www.capcoa.org

NOP 39

Because MTC prepares very few EIRs, the potential for minor projects to overload staff with the need to conduct environmental review--the major consideration driving the setting of a non-zero threshold of significance--is not present. Therefore, the most logical threshold for significant impact of GHG emissions is zero. The IPCC reports have created a solid basis of substantial evidence that additional emissions of greenhouse gases will contribute to cumulative impacts, making global warming more severe and climate more unstable.

NOP 40

Proposed Alternatives #3 and #4

The approach proposed in Attachment A to the Notice of Preparation is for these alternatives to involve both pricing and "non-pricing" concepts. That sounds good. The problem is that these alternatives propose modifying the projects and programs from those in the Proposed Project. Having created an alternative in the 2005 EIR

that altered both pricing, land use and project lists, we can say from experience that this will not provide the most useful information to policymakers. It is impossible to isolate which changes from the Proposed Project produce the results seen. On the basis of our experience, we recommend that the alternatives be defined solely as different lists of investments--combinations of projects and programs.

NOP 41

We suggest that pricing alternatives and "other" alternatives be run as sub-alternatives (sometimes called "options") on each of the alternatives. This will allow investment packages to be compared directly against each other, without confounding the results with multiple variables. While this will involve a few more model runs, it will better help decisionmakers decide which interventions merit taking on the difficulties of implementation.

NOP 42

We strongly support the running of pricing sub-alternatives. Immediately below, we define two we believe need to be run, either replacing the concepts proposed for study in Alternative #3 or in addition to them.

NOP 43

In addition, we urge a land use sub-alternative be run for all alternatives, using the ABAG alternative land use forecast that was created for the scenario assessments last year. These runs are explicitly authorized by Government Code Section 65080 as "alternative planning scenarios" in the RTP. These runs will provide policymakers with the best information possible as to the potential benefits that could result from substantial change in local land use policies and plans. In the absence of confidence about such benefits, that level of change is unlikely to ever occur.

NOP 44

Freeway Congestion Pricing Sub-Alternatives

These two sub-alternatives are designed to be consistent with recent direction received from the Secretary of Transportation, who wrote to Mayor Newsom on February 13 that "the objective of the Urban Partnership Program is to demonstrate the ability of metropolitan areas to reduce traffic congestion in the near-term." Recognizing that the benefits of a HOT lane program will be both small and off in the distant future, TRANSDEF believes policymakers need information on congestion relief choices that will be available to them in the near-term.

NOP 43
Cont.

We fully recognize that near-term relief will not be available until Congress enacts the recommendation of the National Surface Transportation Policy and Revenue Study Commission to rescind the prohibition on the tolling of federal highways in metropolitan areas. Once that has been accomplished, however, MTC will have the flexibility to consider adopting congestion pricing here, if it has been studied in an adopted FEIR.

Each RTP Alternative will be tested with 2 congestion pricing options. These options are to be defined as an open-road toll imposed on the mixed-flow lanes of a freeway during periods when congestion causes the volume-to-capacity ratio to exceed 0.90 for any link of that freeway. This definition was designed to include relief from congestion during periods outside the traditional 2-hour and 4-hour peak periods.

The toll amount for the Maximum Congestion Relief option will be calculated to achieve the Federal DOT aspiration goal of the Urban Partnership Agreement: During peak periods, 90% of the traffic should travel at speeds that are not more than ten miles per hour lower than the posted speed limit. [TRANSDEF recognizes that this goal may not readily translate into terms that are compatible with inputs to the travel demand model. We would be pleased to discuss appropriate work-arounds with planning staff.]

To provide information about the sensitivity of the driving public to a congestion toll, a second option, the Moderate Congestion Relief option, shall be run, using a toll set at half the toll amount of the Maximum Congestion Relief option. (Alternatively, the toll for this sub-alternative could be designed to achieve the Performance Objective of a 20% reduction in congestion per capita hours of delay.)

The Freeway Congestion Pricing Sub-Alternatives will re-code any HOT lanes in the network definitions back to HOV lanes, thus continuing to offer free passage to those vehicles meeting the HOV occupancy requirements. We request that staff monitor the model outputs to see if occupancy definitions need to be shifted to preserve an adequate level of service in the HOV lanes. A large shift to HOV modes could also require the redesignation of mixed-flow lanes to HOV in the network definitions. While these tasks would require extra staff work, it would make the outputs much more meaningful and useful to policymakers.

Emissions-Reduction Alternative

This alternative will be a transportation network that is designed to reduce GHG emissions. The base for this network will be the network submitted for the TRANSDEF Smart Growth Alternative in the 2005 EIR. We plan to tweak it to improve its performance prior to the running of the model.

NOP 43
Cont.

There are a number of compelling reasons to include the Emissions-Reduction Alternative in the EIR:

1. Three of the RTP's Performance Objectives of emissions reductions and VMT reduction are compromised by the inclusion in the RTP of freeway widening projects. Testing done for the Project Performance Evaluations has already shown that freeway widening projects will increase VMT and PM and GHG emissions. Because these projects are certain to be part of the Proposed Project, an alternative needs to be run to test whether a different project mix can more fully achieve the RTP Performance Objectives. By not including projects whose impacts are directly negative for 3 out of 10 of the Plan's Performance Objectives, this Alternative may well demonstrate a more effective strategy.
2. This Alternative's re-allocation of resources will enable superior performance on 6 more of the 10 Performance Objectives. In the 2005 RTP, the TRANSDEF Smart Growth Alternative's expansion of transit service provided 3 times the benefits to low-income communities, when compared to the Adopted Plan.

3. Coupled with the Freeway Congestion Pricing Sub-Alternatives, this Alternative should be able to meet the congestion reduction Performance Objective, thereby providing superior results for all 10 Performance Objectives.
4. Shifting funding away from freeway widening projects and overly expensive transit projects will make substantial resources available for areas of identified need: incentives for PDAs, the shortfall in local streets and roads maintenance, and the shortfall in transit capital. Coupling this Alternative with the Freeway Congestion Pricing Sub-Alternative will make even more resources available. The 2005 TRANSDEF Smart Growth Alternative cost \$6.2 billion less than the adopted Plan, even after adding an additional \$4.2 billion in transit service.
5. This Alternative will demonstrate a local implementation of key recommendations of the National Surface Transportation Policy and Revenue Study Commission.
 - a). A new beginning: This Alternative explores the benefits of rescinding the Commission policy on committed projects;
 - b). Starting with a clean slate, projects are then selected on the basis of their cost-effectiveness and connectivity, i.e., their performance;
 - c). Congestion pricing: The Sub-Alternative, coupled with this Alternative, will demonstrate an optimal environmentally oriented implementation of freeway congestion pricing.
6. This Alternative will be a strong candidate for Environmentally Superior Alternative, a mandatory part of CEQA analysis.
7. This Alternative will provide more economic benefits to the region. A dollar invested in transit service will produce more jobs than a dollar invested in highway construction. That dollar will be spent locally, whereas construction company profits may well leave the community. The multiplier effect means that how funds are spent by MTC and its partner agencies has a significant effect on the economy of the region.
8. The model run for the 2005 RTP EIR did not have the benefit of the interregional model that was built for the Regional Rail Plan. As a result, it was unable to evaluate the mode shift induced in the in-commute from the Central Valley by High Speed Rail over the Altamont Pass, the marquee feature of the TRANSDEF Alternative.
9. Under CEQA, the EIR is required to study all feasible alternatives. This Alternative becomes feasible once a consensus is reached on what is best for the region. The implementation of this Alternative is limited only by political constraints, not by statutory or technical constraints. If the necessary political will is developed, this Alternative will enable far better results to be produced from the expenditure of RTP funds.

Definition for CEQA Purposes of the RTP Project

The description of alternatives in Attachment A to the Notice of Preparation is internally inconsistent with other language which states that "As required by federal metropolitan planning regulations, the plan will be financially constrained to projected transportation revenues that are reasonably expected to be available over the 25

NOP 45

TRANSDEF

3/20/08

Page 5

year period; however the plan may also include a set of illustrative transportation projects that would have benefits if additional new revenue is secured in the future.” The description of alternatives includes within the Proposed Project a list of projects that depend on funding that does not meet the federal criteria of being “reasonably expected to be available.” This is then incorrectly described as “referred to as the financially constrained portion of the plan.” The set of illustrative projects must be removed from the Proposed Project. The Proposed Project must be defined as the fiscally constrained list.

According to Title 23 CFR part 450.322 (f)(10), an RTP requires a fiscally constrained list of projects. An air quality conformity determination must be made on this fiscally constrained list (40 CFR 93 part 108). While the RTP may contain a list of illustrative projects that are unfunded, this latter list is ineligible for a conformity finding, and therefore, cannot be adopted as the RTP or the Proposed Project.

Because of these legal requirements, the definitions of Project Alternatives in Attachment A must be modified. The Proposed Project must be a project that meets the federal requirements for an RTP. It must be fiscally constrained and be able to be determined to conform to the State Implementation Plan.

It is perfectly fine for the list of illustrative projects plus the fiscally constrained list to be studied as an Alternative, but this must be recognized as not meeting the basic requirements of the Project Definition. The significance of this change in the Proposed Project is that future transportation projects from the list of illustrative projects will have to be amended into the RTP when they receive funding. While the environmental analysis for them will have been completed in the FEIR, a new conformity determination may be needed.

Conclusion

TRANSDEF looks forward to collaborating with MTC to prepare an EIR that evaluates an enhanced range of policy options. Thank you for this opportunity to provide these suggestions.

Sincerely,

/s/ DAVID SCHONBRUNN

David Schonbrunn,
President

Transportation 2035 Plan Draft Environmental Impact Report



March 20, 2008

Metropolitan Transportation Commission
101 Eighth Street
Oakland, CA 94607

Attention: Ashley Nguyen

Subject: Transportation 2035 Plan

Dear Ms. Nguyen:

Santa Clara Valley Transportation Authority (VTA) staff have reviewed the NOP for a Draft EIR for the Transportation 2035 Plan. We have no comments at this time.

Thank you for the opportunity to review this project. If you have any questions, please call me at (408) 321-5784.

Sincerely,

A handwritten signature in dark ink, appearing to read "RM", is written over a light blue horizontal line.

Roy Molseed
Senior Environmental Planner

RM:kh

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY

ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF TRANSPORTATION

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March 21, 2008

BAG011
SCH#2008022101

Mr. Steven Heminger, Executive Director
Attn: Ms. Ashley Nguyen
Metropolitan Transportation Commission
101 Eighth Street
Oakland, CA 94607

Dear Mr. Heminger:

Transportation 2035 Plan – Notice of Preparation

Thank you for including the California Department of Transportation (Department) in the environmental review process for the Transportation 2035 Plan. We reviewed the Notice of Preparation (NOP) and have the following comments:

Coordination with Metropolitan Transportation Commission (MTC) and Congestion Management Agencies (CMAs)

The Department would like to commend MTC on the Transportation 2035 Plan effort and appreciates all the initiatives to expand public participation in the early visioning process including the Native American Tribes of the Region. The recent "call for projects" has resulted in expanded coordination with the CMAs and we look forward to the project assessment process and upcoming "trade-off" discussions. Since early 2006, the Department has partially funded the new Freeway Performance Initiative (FPI), participated in many of the regional Transportation 2035 Plan events, and has been working with MTC staff and within the nine-County CMAs processes to confirm and update strategies and projects by county and by corridor.

NOP 46

The 2007 California Regional Transportation Plan (RTP) Guidelines – Consistency with Federal and State Goals & Guidance

The 2007 California Regional Transportation Plan (RTP) Guidelines, which were distributed to the Metropolitan Planning Organizations (MPOs) by our Office of Regional and Interagency Planning, highlight the key changes as a result of SAFETEA-LU related requirements. The 2007 Guidelines expand the discussion of the Transportation 2035 Plan environmental considerations. Consultation with federal and State regulatory agencies during the development of the Transportation 2035 Plan is a requirement per new federal regulation as a result of SAFETEA-LU. The identification of key documents prepared by the resource agencies that may impact future transportation plans or projects and the development of regional mitigation measures should be included in this consultation.

NOP 47

Ms. Ashley Nguyen/Metropolitan Transportation Commission
March 21, 2008
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The efforts to promote the involvement of low-income and minority communities, and Native American Tribal Governments to prevent or mitigate disproportionate negative impacts while improving their mobility, access, safety, and opportunities for affordable housing and economic development should be part of the Transportation 2035 Plan environmental discussions. A discussion of the Transportation 2035 Plan's impacts and consistency with the State's effort to reduce greenhouse gas emissions per Assembly Bill 32 also needs to be noted.

Interregional Connectivity and Goods Movement

The Department is pleased to note that the NOP for the Transportation 2035 Plan carries forward the goal of "efficient freight travel" from the previous regional transportation plan (Transportation 2030 Plan). There is however, a larger context that was elevated within the 2001 Regional Transportation Plan that we would suggest be included in the analysis and development of the Transportation 2035 Plan. Within the "Interregional Gateways" section of the 2001 Regional Transportation Plan, there was clear recognition that "The Bay Area's transportation system serves a growing number of commuters choosing to live outside the region.....and moves goods and freight into and out of the region, serving statewide, national and international markets."

NOP 48

The issue of moving people and goods to and through California's urban economic centers has continued to be elevated legislatively over the past two decades, with passage of SB 300 in 1989 [Interregional Road System (IRRS)]; SB 45 in 1997 [Interregional Improvement Program (IIP)]; and recent SB 1266 Infrastructure Bond categories of Mobility & Trade Corridors (CMIA & TCIF).

The Department looks forward to continued partnership efforts in the MTC region where we can best leverage State transportation funds with local revenues to address both urban mobility and interregional connectivity. Our emphasis for the STIP-IIP funds will remain on bringing the IRRS Focus routes of US 101 and State Route 152 up to minimum facility standard; strengthening the Interstate 80 and Interstate 580 freight corridors, and upgrading the two additional east/west interregional routes of State Route 4 and State Route 12.

Goods Movement

With the MTC's Regional Goods Movement Study and the State of California's Goods Movement Action Plan setting a strong foundation for freight needs within the region and State, the Department feels it is critical to build upon these policy and planning efforts by establishing a strong Goods Movement section in the Transportation 2035 Plan. With the Bay Area serving as home to the fourth largest container port in the nation (20th in the world) along with numerous other ports and intermodal facilities, there is tremendous growth potential for this industry and resultant economic benefit for the region. Even assuming the pending approval of the Proposition 1B Trade Corridors Improvement Fund from the California Transportation Commission this Spring and the successful outcome of the Northern California Trade Corridors Coalition effort to secure funding for their Tier 1 list of projects, this program will not succeed in meeting all the freight mobility improvement needs for the region. The Department believes a section highlighting the challenges and opportunities for the Goods Movement industry is both desirable and critical for leveraging future funding, most notably at the federal level.

NOP 49

Ms. Ashley Nguyen/Metropolitan Transportation Commission
March 21, 2008
Page 3

Emphasizing the significant role of Goods Movement within the Bay Area Region is sorely needed and should be manifested in the Transportation 2035 Plan.

Intercity Rail and Fixed Guideways

The Department commends MTC on completion of the Regional Rail Plan which identifies a vision and an approach to address rail transit needs from 2030 through 2050. We look forward to seeing how the Regional Rail Plan and the Strategic Assessment of the Regional Transit Expansion Program (RTEP) will be used to develop the list of projects to be included in the Transportation 2035 Plan. We encourage MTC to also review the draft California State Rail Plan.

NOP 50

We are also pleased that MTC adopted a Transit Oriented Development policy for station areas and applied that policy to the Regional Transit Expansion Plan. The policy will help to position the region to participate in the grant program opportunities established by Proposition 1B. We also look forward to seeing how the policy will be used to develop the list of projects to be included in the Transportation 2035 Plan.

Safety and Security at Ferry Terminals and Port Facilities

The Bay Area faces many challenges in ensuring adequate mobility, safety and security for its residents when considering hazards, both natural and manmade, and their potential to damage our land-based transportation infrastructure. As we have seen in the recent and distant past during the aftermath of natural disasters (such as the 1989 Loma Prieta earthquake), the ferry system can withstand a large seismic event and play a crucial role in the safe and effective transport of people into and out of an affected area. The same can also be said for Bay Area ports involved in the distribution of goods into and out of the region either for immediate emergency relief or long term economic recovery. The Department feels that appropriate measures should be taken in the Transportation 2035 Plan that highlight the importance of safety and security issues in and around ferry and port related transportation facilities. With the recent passage of SB 976 that replaced the San Francisco Bay Area Water Transit Authority (WTA) with the San Francisco Bay Area Water Emergency Transportation Authority (WETA) combined with the requirement that an emergency water transportation system management plan be prepared, we feel it both timely and beneficial to incorporate these true lifeline routes. It is also worth noting that approximately \$250M in Proposition 1B funding has been set aside for WETA to fund disaster response transportation facilities. These planned improvements should be integrated into the Transportation 2035 Plan.

NOP 51

Traffic Operations System (TOS) Needs

The Freeway Performance Initiative (FPI) within the Transportation 2035 Plan is proposed to provide \$600M toward technology enhancements that improve freeway operations efficiency regionwide, with active discussions in progress to "front-load" those funds to the first 5-10 years of Transportation 2035 Plan. However, a recent Department assessment of unmet needs for the Bay Area's TOS identified a \$938M cost (figure derived from the District's 10-Year State Highway Operation Protection Program (SHOPP) Mobility Needs; this Mobility category is for category 310 and 315 projects). While an FPI funded at \$600M is an impressive acknowledgement of the importance of freeway system management, the Department is concerned that a full third of the identified need would remain unfunded. Providing full funding

NOP 52

Ms. Ashley Nguyen/Metropolitan Transportation Commission

March 21, 2008

Page 4

of the identified need would maximize the efficiencies that effective monitoring, system management and technology integration can bring to our transportation network.

Role of Metering Agreements and Corridor System Management Plans

The proposed FPI within the Transportation 2035 Plan should explicitly acknowledge the role of ramp metering agreements and Corridor System Management Plans (CSMPs) between the Department, MTC, CMAs and local governments in delivering the benefits promised by more effective monitoring, system management and technology integration within our transportation network. For reference, ramp metering agreements have been developed between the Department and local agencies within a travel corridor to document and outline the roles and responsibilities of each agency in utilizing ramp metering as a corridor-level system management strategy. CSMPs are being developed throughout the State for corridors within which funding is being used from the CMIA and Highway 99 Bond Programs. The intent is to eventually develop CSMPs for all urban freeway corridors. MTC and the Department have committed to assist each other in the development of CSMPs and MTC's related FPI corridor studies. This cooperation is documented in MTC Resolutions 3792 and 3794.

NOP 53

Park and Ride Facilities

The environmental analysis for transportation should include Park and Ride (P&R) lots. P&R facilities are integral components of the highway system and provide opportunities for ridesharing and transit alternatives. The Department recommends the implementation of a programmatic category for P&R facilities to encourage a larger mode split for carsharing and transit alternatives.

NOP 54

Community Planning

Transportation investments through the Transportation 2035 Plan should support the Metropolitan Transportation Commission/Association of Bay Area Governments regional blueprint (FOCUS) funded in part by the Department and the California Department of Housing and Community Development. Therefore, we recommend the Transportation 2035 Plan conform to the regional blueprint under the category of land use and physical development.

NOP 55

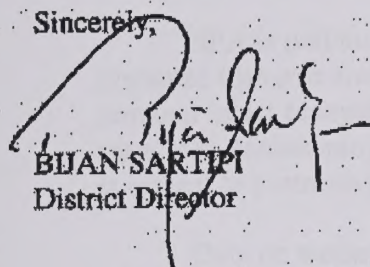
The Department commends the inclusion of vehicle miles traveled and greenhouse gas emissions as areas of evaluation and potential impact measures. This can help ensure that the Transportation 2035 Plan supports AB 32 and the state goal of reducing greenhouse gas emissions.

We suggest that the Transportation 2035 Plan include distinct pedestrian and bicycle elements as a means of drawing attention to these important modes of transportation, thoroughly discussing their unique investment needs and benefits to the region (such as providing access to transit facilities), and programming funding to meet those needs, or a portion thereof, as a regular and integral part of the transportation system.

Ashley Nguyen/Metropolitan Transportation Commission
March 21, 2008
Page 5

Should you have any questions regarding this letter, please call Lee Taubeneck, Deputy District Director, Transportation Planning and Local Assistance, at (510) 286-5908.

Sincerely,



BRIAN SARTIPI
District Director

Transportation 2035 Plan Draft Environmental Impact Report

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY****REGION IX****75 Hawthorne Street
San Francisco, CA 94105-3901**

March 21, 2008

Ms. Ashley Nguyen
EIR Project Manager
Metropolitan Transportation Commission
101 Eighth Street
Oakland, CA 94607

Subject: US EPA Comments on the Notice of Preparation of the Draft
Environmental Impact Report for the Metropolitan Transportation
Commission Transportation 2035 Plan

Dear Ms. Nguyen:

The United States Environmental Protection Agency (EPA) appreciates the opportunity to provide feedback on the scope and content of the environmental information to be included in the Metropolitan Transportation Commission (MTC)'s Transportation 2035 Plan (Plan) and its corresponding Draft Environmental Impact Report (DEIR). EPA is committed to the goal of incorporating environmental considerations early in the planning process. Early coordination results in greater opportunities to avoid sensitive resources and minimize impacts associated with future transportation projects.

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) directs metropolitan planning organizations to consult with resource agencies while developing long-range transportation plans (LRTPs). It also states that LRTPs must include "a discussion of types of potential environmental mitigation activities and potential areas to carry out these activities, including activities that may have the greatest potential to restore and maintain the environmental functions affected by the plan." EPA provides the following comments in support of compliance with these requirements. In addition, we have enclosed a fact sheet which provides guidance for complying with the SAFETEA-LU requirements.

Identification of Avoidance Areas

In all projects, EPA encourages agencies to first avoid, then minimize, and finally mitigate environmental impacts of their actions. Early consultation with resource agencies can provide opportunities for MTC to identify areas that are resource-rich, and therefore should be avoided when planning new transportation infrastructure. It is our hope that information gained in this early consultation will inform transportation

NOP 56

decision-making by identifying areas that should be avoided in order to preserve resources and reduce compensation costs. EPA recommends that MTC follow the process that was used in the Merced County Partnership for Integrated Planning, particularly how environmental information was integrated into Merced County's LRTP (<http://www.dot.ca.gov/hq/tpp/offices/orip/pip.html>).

EPA is particularly concerned about: 1) projects in highly urbanized and heavily impacted resource areas; 2) development in rapidly growing areas with large and/or remnant intact ecosystems; and 3) projects at the urban fringe with potential to impact resources. Maintaining naturally functioning ecosystems, such as streams and wetlands, is critical to protecting water quality, habitat, and natural flood control capacity.

Data on wetland areas, wildlife habitat, and other sensitive resources should be used to identify avoidance areas and to ultimately develop a regional plan for proposed open space and functioning ecosystem areas. The attached fact sheet provides a list of data sources. Consider interviewing staff biologists of local, state, or federal agencies or nonprofit environmental organizations that have responsibility for, or interest in, the MTC region to determine whether other data sets or resource information are available.

Air Quality

The MTC region is a nonattainment area for 8-hour ozone. The Plan must be in conformity with the State Implementation Plan (SIP) to reach attainment with air quality standards. The Plan and DEIR should also consider the potential construction-related impacts to air quality from all proposed projects. The Plan and DEIR should discuss regional land use and transportation policies, such as increased investment in public transit and incentives for compact, mixed-use development, and the link that those projects have to improving air quality and reducing greenhouse gas emissions.

NOP 57

Greenhouse Gas Emissions

The State of California has increased its focus on potential climate change and impacts of increasing greenhouse gas emissions. Specifically, the Global Warming Solutions Act of 2006 and Executive Order S-3-05 recognize the impact that climate change can have within California and provide direction for future reductions of greenhouse gases.

NOP 58

EPA recommends that, as practicable, the DEIR identify the cumulative contributions to greenhouse gas emissions that will result from implementation of the projects contained in the Plan. As MTC continues to refine how to comply with state climate change related regulations, EPA encourages MTC to fully consider the indirect land use impacts associated with transportation projects. Specifically, estimates of the overall Plan's contributions to greenhouse gas emissions should consider any induced growth that transportation projects may contribute to. The Plan should specifically identify how integration of "smart" land use strategies has been considered with each proposed transportation project. EPA is highly supportive of MTC proposals to

encourage reduced vehicle miles traveled, while still meeting the transportation needs of the region.

EPA also recommends that the DEIR discuss the potential impacts of climate change on the projects in the Plan. MTC should identify if there are specific mitigation measures needed to 1) protect projects from the effects of climate change, 2) reduce the projects' adverse air quality effects, and/or 3) promote pollution prevention or environmental stewardship.

Induced Growth

EPA encourages MTC to emphasize in the Plan that proposed locations of projects are tentative and that final decisions on locating transportation facilities are made during project development after public comment and compliance with regulatory requirements. Proposed projects in the Plan may influence private investment in land parcels for future development, resulting in transportation project planning challenges, rising right-of-way costs, and difficulty meeting regulatory requirements and achieving the best environmental outcomes. In addition, decisions regarding the location of proposed projects in the Plan may influence the timing and location of future growth. EPA recommends that MTC consider the methodology outlined in the Caltrans Growth Related Impacts Guidance ([http://www.dot.ca.gov/ser/Growth-related IndirectImpactAnalysis/gri_guidance.htm#intro](http://www.dot.ca.gov/ser/Growth-related%20IndirectImpactAnalysis/gri_guidance.htm#intro)).

NOP 59

Port-Related Impacts

With the continued growth of global trade, operations at the Port of Oakland and associated trade corridors are expected to increase. Local communities that are already affected by freight activities would be further impacted by the increase in goods movement expected in the port area and throughout the region. Given the magnitude of port operations and the expected growth, EPA recommends that the Plan and DEIR include: (1) a discussion that discloses the public health implications to the region and, specifically, to communities adjacent to the ports and major freight transport corridors, (2) a description of cumulative impacts on public health and the current environment as well as trends that have contributed to impacts and/or losses to these resources, (3) a commitment to mitigation measures, and (4) opportunities to engage and work with other agencies and the community to identify strategies to mitigate impacts.

NOP 60

Cumulative Impacts

EPA recommends that MTC include an analysis in the DEIR of the potential cumulative impacts of the projects included in the Plan on all resource areas. Examining the potential impacts of all proposed projects on a regional level and with attention paid to the timeframes for project development can offer a more complete analysis of effects on resources. Cumulative impacts analyses should include information regarding future proposed development contained in city and county general plans and proposed updates. EPA recommends that MTC consider the methodology outlined in the Caltrans

NOP 61

Cumulative Impact Guidance

(http://www.dot.ca.gov/ser/cumulative_guidance/purpose.htm).

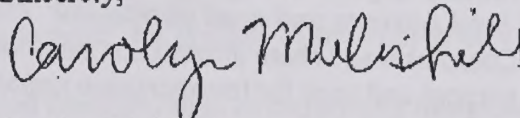
Project-Level Mitigation Guidelines

EPA recommends that MTC include innovative project-level mitigation guidelines or recommendations in the DEIR. Consultation with other agencies, such as the U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, California Department of Fish and Game, San Francisco Bay Regional Water Quality Control Board, and Bay Area Air Quality Management District, could provide recommendations of "state of the art" design features for transportation projects to incorporate to avoid and minimize impacts.

NOP 62

EPA values the opportunity for involvement in the regional transportation planning process. We hope that this involvement will lead to more efficient project planning and improved environmental outcomes. If you have any questions about our comments, feel free to contact me at 415-947-3554.

Sincerely,



Carolyn Mulvihill
Environmental Review Office

Enclosures:

SAFETEA-LU Section 6001 Environmental Provisions Fact Sheet

cc: Jane Hicks, U.S. Army Corps of Engineers
Cay Goude, U.S. Fish and Wildlife Service
Gary Stern, National Marine Fisheries Service
Robert Floerke, California Department of Fish and Game
Brendan Thompson, Regional Water Quality Control Board



SAFETEA-LU SECTION 6001 ENVIRONMENTAL PROVISIONS

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) is the federal surface transportation law passed in August 2005. Section 6001 of SAFETEA-LU describes the transportation planning regulations that the Federal Highway Administration and the Federal Transit Administration oversee. Section 6001 contains provisions that relate to environmental resources:

- **Consultation:** Metropolitan planning organizations (MPOs) must consult with agencies responsible for land use management, natural resources, environmental protection, conservation, and historic preservation during development of long-range transportation plans.
- **Mitigation:** Long-range transportation plans must include "a discussion of types of potential environmental mitigation activities and potential areas to carry out these activities, including activities that may have the greatest potential to restore and maintain the environmental functions affected by the plan."

Following are tips for MPOs in fulfilling the requirements of Section 6001:

- An optimal goal of coordination between resource and transportation planning is the **transferability of plan-level goals and objectives or purpose and need statements to project-level purpose and need statements**. For consistency with NEPA:
 - ✓ Coordinate and share information early with resource agencies to balance the purpose and need for transportation improvements with potential impacts to the environment.
 - ✓ Consider obtaining feedback from resource agencies for the purpose and need of the plan and major transportation projects identified in the plan.
 - ✓ Create a purpose and need that is a statement of a transportation problem, not a specific solution. The statement should be broad enough for a reasonable range of alternatives, yet specific enough to identify alternatives to yield potential real solutions to the problem at hand.
- The long-range planning process occurs at a regional scale, so a detailed level of environmental information is not expected. However, at a minimum, EPA expects plans to show how **proposed corridor and project alternatives**:
 - ✓ Maximize use of existing infrastructure, such as improvements to existing roadways and transit service.
 - ✓ Avoid and minimize environmental impacts, especially in areas such as high quality habitat, wildlife corridors, or other resource-specific target areas.
- Plans should include a **mitigation strategy that promotes regional avoidance, minimization, and mitigation** to preserve pristine areas, or restore or enhance areas with the greatest potential for success:
 - ✓ Use resource data to *inform* transportation decisionmaking.
 - ✓ Use conservation plans and recovery plans to identify critical wildlife corridors, the most important areas to protect for sensitive species, and areas with a high concentration of resources.
 - ✓ Consider conservation plans with as much weight as General (Land Use) Plans when planning transportation investments.

- ✓ Incorporate concepts such as 100 to 200 foot buffers for stream corridors and identification and improvement to priority culverts that restrict wildlife corridors and natural processes of stream and river systems.
- ✓ Use parcel maps to identify larger, undivided parcels for ease of acquisition and preservation and designate areas as potential future mitigation sites.
- Potential data sources include:
 - ✓ U.S. Fish & Wildlife Service and National Marine Fisheries Service species recovery plans
 - ✓ California Department of Fish and Game Statewide Wildlife Action Plan
 - ✓ USDA Natural Resources Conservation Service wetland data
 - ✓ County Habitat Conservation Plans
 - ✓ California Wilderness Coalition, *Missing Linkages* report on wildlife corridors
 - ✓ Nature Conservancy
 - ✓ Local non-profit and land trust groups
 - ✓ Caltrans' Cumulative Impact Guidance has information on data gathering:
http://www.dot.ca.gov/ser/cumulative_guidance/data_gathering.htm#exhibitb
- Plans should establish the foundation for **innovative regional mitigation solutions**:
 - Establish financial mechanisms to fund mitigation, such as development fees (MCAG), sales tax (SANDAG), or the use of funds from BLM land sales to identify and protect critical resource areas.
 - Establish conservation easements that connect to and expand existing conservation areas.
 - Describe locally-developed measures such as county/city designation of open-space, measures requiring development set-backs near streams, etc.

EPA supports the integrated planning sought by these provisions:

- **Early investment in comprehensive planning can be efficient.** Linking land-use and transportation planning with NEPA principles can help reduce project-level delays by reaching early agreement on resource protection areas and appropriate range of alternatives.
- **Early coordination with resource agencies can increase project certainty and improve environmental outcomes.** MPOs should involve resource agencies at key decision-making points. Resource agencies have limited staff to participate in the entire process.
- **Integration of environmental factors and transportation planning must be comprehensive.** The analysis must include impacts to all environmental resources – habitat, water quality, environmental justice, in addition to air quality conformity analysis.
- **EPA is particularly concerned about:** 1) projects in highly urbanized and heavily impacted resource areas; 2) development in rapidly growing areas with large, intact ecosystems; and 3) projects at the urban fringe with potential to impact resources. Maintaining natural ecosystem functions, such as natural desert washes, is critical to protect water quality, habitat, and natural flood control capacity.

Melissa McMahon

From: Ashley Nguyen [ANguyen@mtc.ca.gov]
Sent: Monday, March 24, 2008 7:44 PM
To: Melissa McMahon
Subject: Fwd: NOP of a DEIR for the Transportation 2035 Plan

Melissa:

See NOP comment from BART below.

Ashley Nguyen
Senior Transportation Planner/Analyst
Metropolitan Transportation Commission
101 Eighth Street | Oakland, CA 94607
Tel. 510.817.5809 | Fax 510.817.5848

>>> <MPayne@bart.gov> 3/21/2008 3:31 PM >>>

Dear Ashley,

Thank you for the opportunity to provide comments on the Notice of Preparation of a DEIR for the Transportation 2035 Plan. BART looks forward to reviewing the DEIR on the Transportation Plan in the future and anticipates that at that time we will be able to provide MTC with detailed comments on the DEIR. At this point, however, we would like to note our interest in seeing that the DEIR include a thorough assessment of climate change impacts and potential mitigation measures for these impacts.

NOP 63

The DEIR will provide an opportunity to consider innovative approaches to implementing measures to reduce greenhouse gases and we look forward to

working with MTC to explore the possibilities.

Please feel free to contact me if you should have any questions.

Marianne Payne
BART Department Manager of Planning
(510) 464-6140

Melissa McMahon

From: Ashley Nguyen [ANguyen@mtc.ca.gov]
Sent: Monday, March 24, 2008 7:45 PM
To: Melissa McMahon
Subject: Fwd: Scoping Comments on MTC's RTP
Attachments: rnakadegawa.vcf

Melissa:
See NOP comment from Roy Nakadegawa below.

Ashley Nguyen
Senior Transportation Planner/Analyst
Metropolitan Transportation Commission
101 Eighth Street | Oakland, CA 94607
Tel. 510.817.5809 | Fax 510.817.5848

>>> Roy Nakadegawa <rnakadegawa@myfastmail.com> 3/21/2008 3:51 AM >>>
March 21, 2008

via e-mail

MTC Commissioners and Staff

Scoping Comments on MTC's RTP

The Sac Bee Editorial commentary in regards to the recently released Regional Plan stated "[Sacramento is] Expected to grow by another 1 million people in the next quarter-century, the Sacramento region can no longer plan new roads and transit as it has in the past." The same is even true more so with the Bay Region.

Not only should we de-emphasize Roads and emphasize Transit, we need to address one of our most serious environmental problem which we are facing, that will affect our children and grand children as well as the rest of the world, which is Global Warming caused by increasing greenhouse Gas emission of which transportation in our Region contributes about half the total emissions. We produce around a fifth of the worlds GHG yet we are one twentieth of its population.

NOP 64

To reduce GHG our region needs to focus less on auto congestion relief and more on transit that is integrated to development. ABAG has focused on development near transit, such as BART, but we also need to consider the integration of developing dense transit corridors with

NOP 65

frequent and reliable transit.

I have examined transit in many cities in Europe, Asia, South America as well as North America and the most cost-effective mode of transit that has generated large increases transit ridership are providing priority features with buses. Provide priority to buses such as; Rapid Bus (buses provided signal priority and wider spacing of stops) or the Bus Rapid Transit (an up grade of Rapid bus where buses operate in exclusive lanes), very similar to Light Rail.

Curitiba, Brazil the renown city that perfected Bus Rapid Transit have 5 BRT lines radiating out from City center and each line carries 100,000 trips per day and cost one-twentieth of a metro system like BART. The primary reason for its high usage is that these 5 BRT lines where integrated to dense developed corridors.. Currently they handle 90% of the peak period trips into city center whereas, before buses only handled 5%. Their BRT along with feeder buses currently carries about 40% of their total daily trips.

MTC should also re-prioritize existing some of the BART projects for they are overly costly and ineffective.

NOP 66

For example San Jose BART Extension (SJBX) is costing over \$32 per trip and this cost is based on an extremely inflated ridership. In a recent article the Milpitas Mayor proudly claimed that their SJBX Station will be one of the highest utilized station with 30,000 trips per day. If one compares this number to current BART operation, it equals what BART's Montgomery and Embarcadero stations handle today and these stations have far greater dense development with no parking. Will Milpitas be developed to the degree of current mentioned BART stations on 20 years?

The Milpitas Station will be more auto oriented for the plans call for several thousand parking spaces in structures immediate to the station. Since they will cost \$40,000 per space, it is highly unlikely that they will be relocated to build a decent pedestrian Transit Oriented Development.

SJBX is estimated to cost \$4.7 Billion but construction costs of basic materials have inflated 30-40% since. So the cost per trip could easily increase the 20-30% based on the inflated ridership.

In addition, the first segment for SJBX is the Warm Springs Extension (WSX) that BART will undertake and the current estimate of about \$680 million and will generate only 7,000 riders per day in 20 years. The Warm Springs station has little existing development around its area and

the plans call for 2,000 space surface parking. Again, it will be very auto oriented. Does MTC want to discourage auto use on the transit projects it funds?

NOP 67

There is another project that MTC should fully consider and promote. It is AC Transit Bus Rapid Transit (BRT) system, which is routed through East Bay's most developed corridor. It is estimated to attract close to 50,000 trips per day with a cost of most expensive alternative of \$400 million. It will serve a diverse economic and ethnic group, comprised of people not owning cars, transit dependent, seniors and handicapped and will actually reduce some existing parking. One alternative cost per rider is as low as \$12+ per trip..

NOP 68

Since there already is the Capitol Corridor RR serving San Jose, in lieu of SJBX, MTC could fund a bus system similar to Brisbane, Australia who has a BRT that serves their outlying suburban communities thoroughly. It operates with local buses and when many buses get to the Busway some local buses enter the Busway similar to cars entering freeways. This BRT has a ridership of around 100,000 trips per day with a peak of 10,000 per hour which exceeds any single BART line. During peak periods they have over 200 buses accessing Busway from about 30 routes of different operators. During peak periods over 200 buses per hour use the Busway. Interestingly, some of the buses only use a portion of the Busway just to speed up service and provide better bus service to other destinations.

A Bus transit system could start up using the freeways HOV lanes and when the HOV lanes become congested, one could develop a separate exclusive lane Busway as Brisbane.

This concept would also be very appropriate transit application to a sprawled low-density area such as Eastern Contra Costa where eBART is being proposed. Rather than plan a future fixed rail in the middle of a freeway, since it is a fixed rail system it will require considerable parking to gain any ridership which will still require considerable auto use or provide an expensive bus shuttle. Also to develop a future TOD in the middle of a freeway will be difficult in that it is compounded by all the multi-lane traffic to gain general access to the development and station. It will definitely not be pedestrian friendly.

--

Roy Nakadegawa P.E.
rnakadegawa@myfastmail.com <mailto:rnakadegawa@myfastmail.com>
phone: 510-526-5094; fax: 510-526-5094
751 The Alameda Berkeley, CA 94707

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Roy Nakadegawa P.E.
rnakadegawa@myfastmail.com

phone: 510-526-5094; fax: 510-526-5094

751 The Alameda Berkeley, CA 94707

Melissa McMahon

From: Ashley Nguyen [ANguyen@mtc.ca.gov]
Sent: Monday, March 31, 2008 3:55 PM
To: Melissa McMahon
Subject: Fwd: Re: MTC Scoping Meetings for Transportation 2035 Environmental Impact Report

Melissa:
Pls add this to list of NOP comment letters.

Ashley Nguyen
Senior Transportation Planner/Analyst
Metropolitan Transportation Commission
101 Eighth Street | Oakland, CA 94607
Tel. 510.817.5809 | Fax 510.817.5848

>>> <rottenappleranch@aol.com> 3/6/2008 4:42:18 PM >>>

With our population aging, failure to increase the availability, which means significantly shortening headways and interconnectedness of all public transit systems--rail, bus, ferry, and airport shuttles--will disenfranchise a growing number of the older population that either has to give up driving or chooses to do so as the roadways become increasingly congested.? This would have a very negative impact on the social environment.? Today's network of public transportation options in most of the 9 county Bay Region is designed to serve only those with no transportation choice other than public transit.? Improvements are coming far too slowly to move people from personal cars to buses, trains, etc.? Failure to honestly address this issue in your EIR would be a fraud.

Steve Beck
2211 Burnside Road
Sebastopol, CA 95472

-----Original Message-----

From: MTC info <info@mtc.ca.gov>
To: MTC info <info@mtc.ca.gov>
Sent: Thu, 6 Mar 2008 3:10 pm
Subject: MTC Scoping Meetings for Transportation 2035 Environmental Impact Report

Are there significant transportation-related environmental issues such as air quality, climate change or land use that MTC should explore in its environmental assessment of the Transportation 2035 Plan?

?

Contribute to the discussion!

?

MTC is preparing a Draft Environmental Impact Report (EIR) for the Transportation 2035 Plan, a master plan to guide the nine-county San Francisco Bay Area region's transportation investments over the next 25 years. The EIR for the Transportation 2035 Plan will analyze the broad, regional environmental impacts of implementing the investments identified in the plan.

?

MTC currently is seeking comments on the scope and content of the environmental information that will be evaluated in the EIR. Two regional scoping meetings will be held to solicit this input:?

?

Monday, March 10, 2008
10 a.m. to Noon
Joseph P. Bort MetroCenter
Claremont Conference Room
(See receptionist on 3rd Floor)
101 Eighth Street
Oakland, CA 94607

?

Thursday, March 13, 2008
6 p.m. to 8 p.m.
Joseph P. Bort MetroCenter
Lawrence D. Dahms Auditorium
101 Eighth Street
Oakland, CA 94607

?

These meetings also will provide an opportunity for agencies and the public to consult with MTC about the Transportation 2035 Plan and the Transportation Improvement Program (TIP).

?

Written comments can be sent to the Metropolitan Transportation Commission, 101 Eighth Street, Oakland, CA 94607 (attention: Ashley Nguyen, EIR Project Manager). Comments must be received by MTC by no later than March 21, 2008.?

Melissa McMahon

From: Ashley Nguyen [ANguyen@mtc.ca.gov]
Sent: Monday, March 31, 2008 3:56 PM
To: Melissa McMahon
Subject: Fwd: RE: MTC Scoping Meetings for Transportation 2035 EnvironmentalImpact Report

Melissa:
Pls add this to the list of NOP comment letters.

Ashley Nguyen
Senior Transportation Planner/Analyst
Metropolitan Transportation Commission
101 Eighth Street | Oakland, CA 94607
Tel. 510.817.5809 | Fax 510.817.5848

>>> "BigWayne19" <BigWayne19@comcast.net> 3/6/2008 4:44:50 PM >>>

Are there significant transportation-related environmental issues such as air quality, climate change or land use that MTC should explore in its environmental assessment of the Transportation 2035 Plan?

----- yes. motorcycles . . .

Contribute to the discussion!

----- why not via email ? . . .

MTC currently is seeking comments on the scope and content of the environmental information that will be evaluated in the EIR.

----- most of your/our problems will go away when gasoline reaches \$4.75/gal. because then motorcycles/scooters will be >20% of the traffic -
which will look as if traffic was reduced by 15% . . .

Written comments can be sent to the Metropolitan Transportation Commission, 101 Eighth Street, Oakland, CA 94607 (attention: Ashley Nguyen, EIR Project Manager). Comments must be received by MTC by no later than March 21, 2008.

----- no e, ashley ? . . .

Big

Melissa McMahon

From: Ashley Nguyen [ANguyen@mtc.ca.gov]
Sent: Monday, March 31, 2008 3:56 PM
To: Melissa McMahon
Subject: Fwd: Re: MTC Scoping Meetings for Transportation 2035 Environmental Impact Report

Melissa:
Pls add this to the list of NOP comment letters.

Ashley Nguyen
Senior Transportation Planner/Analyst
Metropolitan Transportation Commission
101 Eighth Street | Oakland, CA 94607
Tel. 510.817.5809 | Fax 510.817.5848

>>> "LOWELL E GRATTAN" <lowell_grattan@prodigy.net> 3/6/2008 5:40:32 PM
>>>

Will the new plan MTC Plan help solve the two most important problems in the bay area, Housing costs and Road congestion? Studies are now available that high-density housing pollutes more than single family housing. Secondly, transit pollutes as much and in some systems as Light-rail VTA more than autos, out side of New York. Will these facts be part of the EIR?

Best,

Lowell Grattan
(408) 379-2350
lowell_grattan@prodigy.net

----- Original Message -----

From: MTC info
To: MTC info
Sent: Thursday, March 06, 2008 3:10 PM
Subject: MTC Scoping Meetings for Transportation 2035 Environmental Impact Report

Are there significant transportation-related environmental issues such as air quality, climate change or land use that MTC should explore in its environmental assessment of the Transportation 2035 Plan?

Contribute to the discussion!

MTC is preparing a Draft Environmental Impact Report (EIR) for the Transportation 2035 Plan, a master plan to guide the nine-county San Francisco Bay Area region's transportation investments over the next 25 years. The EIR for the Transportation 2035 Plan will analyze the broad, regional environmental impacts of implementing the investments identified in the plan.

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101 Eighth Street
Oakland, CA 94607

Thursday, March 13, 2008
6 p.m. to 8 p.m.
Joseph P. Bort MetroCenter
Lawrence D. Dahms Auditorium
101 Eighth Street
Oakland, CA 94607

These meetings also will provide an opportunity for agencies and the public to consult with MTC about the Transportation 2035 Plan and the Transportation Improvement Program (TIP).

Written comments can be sent to the Metropolitan Transportation Commission, 101 Eighth Street, Oakland, CA 94607 (attention: Ashley Nguyen, EIR Project Manager). Comments must be received by MTC by no later than March 21, 2008.

Melissa McMahon

From: Ashley Nguyen [ANguyen@mtc.ca.gov]
Sent: Monday, March 31, 2008 3:56 PM
To: Melissa McMahon
Subject: Fwd: Re: MTC Scoping Meetings for Transportation 2035 Environmental Impact Report

Melissa:
Pls add this to the list of NOP comment letters.

Ashley Nguyen
Senior Transportation Planner/Analyst
Metropolitan Transportation Commission
101 Eighth Street | Oakland, CA 94607
Tel. 510.817.5809 | Fax 510.817.5848

>>> <Refugiomoreno@aol.com> 3/6/2008 6:53:14 PM >>>

With the funding that Bay Area Air Quality Management District allocates to study the impacts of unhealthy air around the San Francisco Bay Area, we should study the possibility of installing 100-foot solar powered air filter -towers along the southern perimeter of San Jose. Since 80% of the time the wind is blowing in a southerly direction, the filters would not have to work as hard to suck up unhealthy smoggy air and clean it by using the latest technology and air filtration systems. If the board of directors took a ride up Sierra Road in San Jose and looked down on the Santa Clara Valley, the vision is clear as day.

Thank you for your sincere consideration

Refugio Moreno
832 Locust Street
San Jose California 95110

408-687-0625 or 408-293-2528

*****It's Tax Time! Get tips, forms, and advice on AOL Money &

Finance. (<http://money.aol.com/tax?NCID=aolprf00030000000001>)

Melissa McMahon

From: Ashley Nguyen [ANguyen@mtc.ca.gov]
Sent: Monday, March 31, 2008 3:57 PM
To: Melissa McMahon
Subject: Fwd: RE: MTC Scoping Meetings for Transportation 2035 Environmental Impact Report

Melissa:

Pls add this to the list of NOP comment letters.

Ashley Nguyen
Senior Transportation Planner/Analyst
Metropolitan Transportation Commission
101 Eighth Street | Oakland, CA 94607
Tel. 510.817.5809 | Fax 510.817.5848

>>> "Tim Tucker" <ttucker@cityofmartinez.org> 3/10/2008 7:54:57 AM >>>

The Regional Water Quality Control Board must believe there are significant water quality issues related to the construction of new bike lanes, paths and sidewalks along with the widening of existing roadways based on their proposed new regulations. I imagine these impacts will be addressed on a project by project basis.

Tim Tucker, P.E.

City Engineer

City of Martinez

525 Henrietta Street

Martinez, CA 94553

Phone: (925) 372-3562

Fax: (925) 372-0257

Cell: (925) 383-8598

From: MTC info [<mailto:info@mtc.ca.gov>]
Sent: Thursday, March 06, 2008 3:10 PM
To: MTC info
Subject: MTC Scoping Meetings for Transportation 2035 Environmental Impact Report

Are there significant transportation-related environmental issues such as air quality, climate change or land use that MTC should explore in its environmental assessment of the Transportation 2035 Plan?

Contribute to the discussion!

MTC is preparing a Draft Environmental Impact Report (EIR) for the Transportation 2035 Plan, a master plan to guide the nine-county San Francisco Bay Area region's transportation investments over the next

25

years. The EIR for the Transportation 2035 Plan will analyze the broad, regional environmental impacts of implementing the investments identified in the plan.

MTC currently is seeking comments on the scope and content of the environmental information that will be evaluated in the EIR. Two regional scoping meetings will be held to solicit this input:

Monday, March 10, 2008

10 a.m. to Noon

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101 Eighth Street

Oakland, CA 94607

Thursday, March 13, 2008

6 p.m. to 8 p.m.

Joseph P. Bort MetroCenter

Lawrence D. Dahms Auditorium

101 Eighth Street

Oakland, CA 94607

These meetings also will provide an opportunity for agencies and the public to consult with MTC about the Transportation 2035 Plan and the Transportation Improvement Program (TIP).

Written comments can be sent to the Metropolitan Transportation Commission, 101 Eighth Street, Oakland, CA 94607 (attention: Ashley Nguyen, EIR Project Manager). Comments must be received by MTC by no later than March 21, 2008.

EDMUND G. BROWN JR.
Attorney General

State of California
DEPARTMENT OF JUSTICE



1515 CLAY STREET, 20TH FLOOR
P.O. BOX 70550
OAKLAND, CA 94612-0550

Telephone: 510-622-2174
Facsimile: 510-622-2270
E-Mail: laura.zuckerman@doj.ca.gov

October 1, 2008

By Facsimile and U.S. Mail
(510) 817-5848

Ms. Ashley Nguyen
EIR Project Manager
Metropolitan Transportation Commission
101 Eighth Street
Oakland, CA 94607

RE: Comments on the Notice of Preparation for Draft Environmental Impact Report For the Transportation 2035 Plan

Dear Ms. Nguyen:

The Attorney General submits these comments to the Metropolitan Transportation Commission ("MTC") on the Notice of Preparation for the Draft Environmental Impact Report ("DEIR") for the proposed Transportation 2035 Plan ("Proposed Transportation Plan"). Although the deadline for comments on the Notice of Preparation has passed, we request that MTC consider these comments in preparing the DEIR.

We commend MTC for committing to evaluate the climate change impacts of the investments identified in the Proposed Transportation Plan. We also commend MTC for working to provide funding for "smart growth" development strategies that will reduce vehicle emissions associated with new development, for working to expand the bicycle network, and for including other elements of a Climate Change Program in the Proposed Transportation Plan. As climate change is one of the most critical environmental challenges to face our communities today, we urge MTC to embrace the opportunity it has in the Proposed Transportation Plan and the accompanying DEIR to show further leadership by identifying a comprehensive transportation strategy that will reduce emissions of the greenhouse gasses ("GHG") that cause global warming.

Global Warming in California

The Intergovernmental Panel on Climate Change of the United Nations has found

Ms. Ashley Nguyen
October 1, 2008
Page 2

overwhelming evidence that global warming is occurring and is caused by human activity.¹ The California Climate Change Center reports that temperatures in the State are expected to rise 4.7 to 10.5°F by the end of the century.² Such increases would have serious consequences, including substantial loss of snowpack, an increase of as much as 55% in the risk of large wildfires, reductions in the quality and quantity of agricultural products, exacerbation of California's air quality problems, and adverse impacts on human health from increased heat stress, including heat-related deaths, as well as increases in asthma, respiratory, and other health problems.³

California recognizes that global warming is an urgent problem. As reflected in the California Global Warming Solutions Act of 2006 ("AB 32") and Executive Order S-3-05, we must substantially reduce our total GHG emissions by mid-century in order to stabilize atmospheric concentrations of GHGs at a level that will avoid dangerous climate change. This makes it imperative to address GHG emissions from the transportation sector, which account for 38% of the GHG emissions in the State.⁴ In the Bay Area, emissions from the transportation sector are even greater, accounting for 50% of the total.⁵ If we fail to make better transportation and land-use decisions – at all levels of government and at every opportunity – in a very short time, our climate goals may be out of reach. According to Rajendra Pachauri, Chairman of the United Nations Intergovernmental Panel on Climate Change ("IPCC"), "If there's no action before 2012, that's too late. What we do in the next two to three years will determine our future. This is the defining moment."⁶

¹United Nations Intergovernmental Panel on Climate Change, *Fourth Assessment Report: Climate Change 2007* (February 2007) *Working Group I Report, The Physical Science Basis, Summary For Policymakers* ("IPCC 4th").

²California Climate Change Center, *Our Changing Climate: Assessing the Risks to California* (July 2006) page 2, available at <<http://www.energy.ca.gov/2006publications/CEC-500-2006-077/CEC-500-2006-077.PDF>> (as of September 29, 2008). The report was prepared by the Climate Change Center at the direction of CalEPA pursuant to its authority under Governor's Executive Order No. S-3-05 (June 1, 2005) ("Exec. Order S-3-05").

³*Id.* at pp. 2, 10; Exec. Order S-3-05.

⁴California Air Resources Board, *Climate Change Draft Scoping Plan* (June 27, 2008) page 7 ("Draft Scoping Plan").

⁵Bay Area Air Quality Management District, *Source Inventory of Bay Area Greenhouse Gas Emissions* (November 2006) page 7.

⁶Rosenthal, *U.N. Chief Seeks More Leadership on Climate Change*, N.Y. Times (November 18, 2007).

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California Environmental Quality Act

As the Legislature has recognized, global warming is an “effect on the environment” under the California Environmental Quality Act (“CEQA”), and an individual project’s incremental contribution to global warming can be cumulatively considerable.⁷ The projects authorized in the Proposed Transportation Plan will result in significant increases in the GHG emissions that contribute to global warming.

CEQA was enacted to ensure that public agencies do not approve projects unless they include feasible alternatives or mitigation measures that substantially reduce the significant environmental effects of the project.⁸ CEQA requires that “[e]ach public agency shall mitigate or avoid the significant effects on the environment of projects that it carries out or approves whenever it is feasible to do so.”⁹ This requirement is recognized as “[t]he core of a DEIR...”¹⁰ Therefore, a DEIR must identify mitigation measures and examine alternatives that would reduce the emissions of greenhouse gases that contribute to global warming.¹¹ These requirements of CEQA are consistent with federal law, which requires the Proposed Transportation Plan to consider projects and strategies that will “protect and enhance the environment” and “promote energy conservation” and to discuss “potential environmental mitigation activities.”¹²

An EIR like the DEIR for the Proposed Transportation Plan must provide an accurate depiction of existing environmental conditions.¹³ “Before the impacts of a project can be assessed and mitigation measures considered, an EIR must describe the existing environment. It is only against this baseline that any significant environmental effects can be determined.”¹⁴

⁷See Cal. Pub. Res. Code, § 21083.05, subd. (a); see also Sen. Rules Comm., Off. Of Sen. Floor Analyses, analysis of Sen. Bill No. 97 (2007-2008 Reg. Sess.), Aug. 22, 2007.

⁸Pub. Resources Code, § 21002.

⁹Pub. Resources Code, §§ 21002.1, subd. (b), and 21081; see also *Mountain Lion Foundation v. Fish and Game Commission* (1997) 16 Cal.4th 105, 134.

¹⁰*Citizens of Goleta Valley v. Board of Supervisors of Santa Barbara County* (1990) 52 Cal.3d 553, 564-65.

¹¹Pub. Resources Code, § 21002.1(a); Cal. Code Regs., tit. 14, § 15130, subd. (b)(5).

¹²23 U.S.C. §§ 134(h) and 134(i)(2)(B)(i). (See text accompanying fn. 19, *infra*.)

¹³Cal. Code Regs., tit. 14, § 15125, subd. (a).

¹⁴*County of Amador v. El Dorado County Water Agency* (1999) 76 Cal.App.4th 931, 952.

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The DEIR Should Consider Climate Change Impacts, As Well As Effective Methods of Mitigation and Alternatives to Reduce Such Impacts

The Proposed Transportation Plan will authorize expenditure of approximately \$223 billion for transportation projects, including road construction and improvements that will provide additional road capacity and accommodate more vehicles. These projects will contribute cumulatively to the Bay Area's existing GHG load. In addition, implementing the Proposed Transportation Plan will result in increased GHG emissions during construction of the authorized projects, resulting in a significant cumulative impact on climate change. The DEIR should evaluate all the anticipated climate change impacts of GHG emissions from these actions, including emissions of black carbon from diesel-powered vehicles, as black carbon also contributes significantly to global warming.¹⁵

"Smart" land-use strategies can result in a reduction in vehicle miles traveled ("VMT") over the long term, which in turn is critical to reducing GHG emissions from the transportation sector. Statewide, VMT increased approximately 35% from 1990 to 2007, and under a business-as-usual scenario, VMT is currently expected to increase another 20% by 2020.¹⁶ According to the California Energy Commission, if we do not slow this anticipated growth in VMT, the increase will completely nullify the other advances that the State is making to control transportation-related emissions, including lowering the carbon content of fuel.¹⁷

As the Air Resources Board notes, "[t]he key to addressing the VMT challenge is providing people with more choices through diversified land use patterns, greater access to alternative forms of transportation including transit, biking and walking, and creating cities and towns where people can live, work and play without having to drive great distances."¹⁸ In addition, the way a transportation plan allocates funds among potential transportation projects can make a significant difference in the amount of transportation-generated GHG emissions in the future. The DEIR should discuss whether the Proposed Transportation Plan *maximizes* the use of available funds for public transit, alternative fuel vehicles, carpool, vanpool, rideshare, pedestrian and bicycle projects (including "Safe Routes to School" programs), and other measures that reduce VMT and/or GHG emissions.

¹⁵Black carbon is a strong absorber of solar radiation, and black carbon particles mixed with dust and chemicals in the air may be the second biggest contributor to global warming. (See California Air Resources Board, Health Effects of Diesel Particulate Matter pages 4-5, available at <http://www.arb.ca.gov/research/diesel/dpm_draft_3-01-06.pdf> [as of September 29, 2008].)

¹⁶Draft Scoping Plan Appendices page C-22.

¹⁷California Energy Commission, The Role of Land Use in Meeting California's Energy and Climate Change Goals, Final Staff Report (August 2007) pages 10, 18.

¹⁸ Draft Scoping Plan Appendices page C-22.

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CEQA requires that an EIR evaluate the potential environmental impacts of an entire project, which in this context we believe represents the entire \$223 billion of authorized expenditures – not just the \$31.6 billion for projects MTC identifies as “discretionary,” but also the \$191 billion for projects identified as “committed,” projects included in the prior Transportation Plan but not yet constructed. The EIR for the prior Transportation Plan was prepared before AB 32, with its GHG-emission reduction goals, was enacted. The prior Transportation Plan and EIR also were adopted before the enactment of the federal act (effective August 2005) (SAFETEA-LU) that requires a Transportation Plan to address projects and strategies that will “protect and enhance the environment, promote energy conservation, improve the quality of life”¹⁹ Finally, the California Transportation Commission (“CTC”) recently adopted the Addendum to the 2007 Regional Transportation Plan Guidelines, “Addressing Climate Change and Greenhouse Gas Emissions During the RTP Process;” this guidance also did not exist when the EIR for the prior Transportation Plan was adopted.²⁰

Accordingly, CEQA requires evaluation in the DEIR of climate change impacts both of the “committed” projects and the “discretionary” projects, and ways to eliminate or reduce such impacts. It also requires consideration of an alternative that, where feasible, eliminates from the Proposed Transportation Plan so-called “committed” projects that would contribute to adverse cumulative impacts on climate.²¹

The Proposed Transportation Plan includes projects that MTC has selected for funding with \$31.6 billion in “discretionary” funds. To select these projects, MTC stated it used a performance rating system to evaluate the projects’ anticipated effectiveness at meeting the region’s transportation goals. Among other things, the adopted goals include “climate protection,” and the “performance objectives” include reducing VMT and reducing emissions (including GHGs). We commend MTC for adopting these goals and objectives.

The Proposed Transportation Plan also includes an additional \$191 billion for projects that were authorized in the last Transportation Plan, which MTC refers to as “committed” projects. MTC indicates that the “committed” projects include about \$29 billion for transit and road expansion and \$162 billion to maintain the existing transportation system. We understand that the \$29 billion of “committed” projects for transit and roadway expansion have been proposed for inclusion in the new Transportation Plan without renewed evaluation of the relative need for, benefits of, or impacts of these projects vis-à-vis others, and regardless of how well they meet MTC’s identified goals and performance objectives. We urge MTC to rectify this omission with respect to the “committed” transit and roadway expansion projects (which reflect only 15% of the “committed” funding). MTC’s own research shows that achieving reductions in

¹⁹23 U.S.C. § 134(h)(1)(E).

²⁰It was adopted by the California Transportation Commission on May 29, 2008.

²¹If there is a contractual obligation or other overriding reason to complete a particular low-performing “committed” expansion project, the DEIR should discuss this.

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GHG emissions consistent with the goals of AB 32 will be extremely difficult:²² this highlights the need for careful and complete evaluation of impacts on VMT and GHG emissions of *all* expenditures for road and transit expansion in the Proposed Transportation Plan.

MTC staff's analysis indicates that many of the "committed" expansion projects support only one, in some cases *none*, of the identified performance goals. If low-performing "committed" projects were eliminated where feasible to do so, funding would be available to cover transit shortfalls, particularly for BART, Muni, and AC Transit, which together carry 80% of the transit riders in the Bay Area.²³ If these shortfalls are not addressed, or if they are addressed through fare increases, as recently proposed,²⁴ ridership may fall, with a concomitant increase in GHG emissions. The DEIR should address the implications of the potential transit shortfalls on GHG emissions and whether those impacts could be reduced by using funds currently proposed to be allocated to low-performing "committed" projects. This would be consistent with the direction in the CTC's guidelines for addressing climate change in RTPs to "[c]onsider shifting transportation investments towards improving and expanding urban and suburban core transit, programs for walkability, bicycling and other alternative modes, transit

²²See Therese W. McMillan, Deputy Executive Director, Policy, Metropolitan Transportation Commission, presentation to California Transportation Futures Symposium (September 3, 2008), Transportation 2035: S.F. Bay Area - Targeting Health Through Environment, available at <http://www.dot.ca.gov/hq/tpp/offices/osp/presentations/McMillan.T.ppt> (as of September 30, 2008).

²³There is currently a projected \$19 billion shortfall in transit capital and operating needs for transit in the Bay Area over the life of the Proposed Transportation Plan, and a projected \$4.2 billion shortfall in BART core capacity improvements. (See Commission Meeting presentation (July 23, 2008), Transportation 2035: Financially Constrained Investment Plan, page 22, available at http://apps.mtc.ca.gov/meeting_packet_documents/agenda_1116/T2035_Recommendations_short_v.3.ppt [as of October 1, 2008].) These figures were generated before recent increases in public transit ridership due to high gasoline prices. The American Public Transportation Association reports more than a 5% increase in BART ridership in 2008. (See <http://www.apta.com/research/stats/ridership/index.cfm> [as of September 29, 2008].) Thus, the funding needs for existing transit service may well exceed these estimates.

²⁴See, e.g., *Consider congestion pricing for BART*, San Francisco Chronicle (September 15, 2008), available at <http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2008/09/15/EDIJ12T13A.DTL&hw=BART+fare&sn=001&sc=1000> (as of September 30, 2008); Gordon, *BART considers higher fares*, San Francisco Chronicle (September 12, 2008), available at <http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2008/09/12/MNS412SGBC.DTL&hw=BART+fare&sn=002&sc=491> (as of September 30, 2008), which noted that BART trains are currently near capacity in peak hours.

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access, housing near transit, and local blueprint plans that coincide with the regional blueprint.”²⁵

The DEIR should also address, at a minimum, the following issues:

1. ***The impact of high-occupancy toll (“HOT”) lanes on carpooling, transit ridership, VMT, and GHG emissions.*** A principal benefit of the HOT lane network is savings in travel time for people driving alone (both in the HOT lane and in other lanes). Some commentators have expressed concerns about the effect of HOT lanes on “induced travel,” noting that “at the same time that some drivers are encouraged to stay away from congestion or higher peak-period tolls, others are drawn to use the HOT lanes because they are relatively less congested than other options.”²⁶ At least one expert panel has expressed concerns that a proposed increase in freeway lane miles for a “managed lane” network similar to the HOT lane network proposed here would “perpetuate auto-oriented development and reduce transit’s competitiveness.”²⁷

In recognition of these concerns, the DEIR should evaluate, for each corridor, the effect of (1) creation of a new lane to be used as a HOT lane, or (2) conversion of an existing HOV lane to a HOT lane, whichever is applicable, including any increase in the carpool requirement from 2 to 3 occupants,²⁸ on the following: (a) carpooling rates, (b) VMT, (c) induced travel (commuters, carpoolers, telecommuters, etc., who are thereby induced to start driving alone), and (d) long-term housing distribution patterns (i.e., “induced growth” of housing in areas

²⁵California Transportation Commission, Addendum to the 2007 Regional Transportation Plan Guidelines: Addressing Climate Change and Greenhouse Gas Emissions During the RTP Process (May 29, 2008) page 2 (emphasis added).

²⁶ Dahl, *The Price of Life in the Fast Lane* (2003) 111 Env'tl. Health Persp., Number 16, available at <<http://www.ehponline.org/members/2003/111-16/spheres.html>> (as of September 30, 2008), citing the director of the Bridge Tolls Advocacy Project in New York.

²⁷See Independent Transit Planning Review Services December 2006 Final Report, prepared for the San Diego Association of Governments (December 2006) pages ES-5 and 3-32, available at <http://www.sandag.cog.ca.us/uploads/publicationid/publicationid_1274_6239.pdf> (as of September 30, 2008). The panel also observed, “Smart Growth efforts will likely be weakened by managed lanes’ alleviation of congestion and its encouragement of auto-oriented growth away from transit corridors.” (See *id.* at pp. 6-16.)

²⁸ The Bay Area High-Occupancy/Toll (HOT) Network Study Final Report notes that implementing HOT lanes will likely require increasing carpool occupancy requirements. MTC, Bay Area High-Occupancy/Toll (HOT) Network Study Final Report (September 2007) page 7.

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where HOT lanes can be used to commute to employment centers).²⁹ The DEIR should provide both short-term and long-term evaluation of the environmental impacts/benefits of the HOT lane network. In particular, the EIR should evaluate the potential effects of induced travel where the freeway is expanded to create a HOT lane.³⁰

2. ***The effect on GHG emissions of different prioritizations of uses of HOT lane revenues.*** MTC recently adopted “HOT Network Implementation Principles” that indicate HOT lane revenues will be used “to finance and construct the HOT network” and “provide transit services and improvements in the corridors.” However, it is not clear when *any* excess revenues will be generated from the HOT lane network, and what the priority will be for investment of such revenues. We understand that, if completing the area-wide HOT lane network is the priority use for HOT lane revenues, the anticipated benefits of excess revenue from the HOT lane network would not accrue to public transit until the network is completed in 2025. The EIR should disclose the anticipated timing and amount of excess revenues (i.e., revenues not need to cover network expenses), and

²⁹The California Department of Transportation’s (“Caltrans”) own guidance for preparing an EIR recognizes the need to evaluate how a project will influence growth. (See Caltrans, EIR/EA Annotated Outline (April 2008) pages 37-39, available at <http://www.dot.ca.gov/ser/downloads/templates/eir_ea_SER.doc> [as of September 30, 2008]; Caltrans, Guidance for Preparers of Growth-related, Indirect Impact Analyses (May 2006), available at <http://www.dot.ca.gov/ser/Growth-related_IndirectImpactAnalysis/gri_guidance.htm> [as of September 30, 2008].)

³⁰ The Superior Court for the County of Sacramento recently invalidated Caltrans’s EIR for an HOV lane project in Sacramento, in part because it did not adequately evaluate the impacts of induced travel. (See *Environmental Council of Sacramento v. Caltrans* (July 15, 2008, 07CS00967) <<http://nastsacramento.blogspot.com>> [as of September 29, 2008].) There are numerous reports and studies on the “induced travel” impacts of new freeway lanes and recommended methods of analysis. (See, e.g., U.S. Department of Transportation Federal Highway Administration, Induced Travel: Frequently Asked Questions, available at <<http://www.fhwa.dot.gov/Planning/itfaq.htm>> [as of September 30, 2008]; Cervero & Hanson, *Induced Travel Demand and Induced Road Investment* (2002) 36 J. Transp. Econ. & Pol’y, Part 3, pp. 469-490; Litman, *Generated Traffic and Induced Travel: Implications for Transport Planning* (September 17, 2007), available at <<http://www.vtpi.org/gentraf.pdf>> [as of September 30, 2008]; Litman, *Smart Transportation Investments: Reevaluating the Role of Highway Expansion for Improving Urban Transportation* (October 6, 2006), available at <http://www.vtpi.org/cong_relief.pdf> [as of September 30, 2008]; Cervero, *Road Expansion, Urban Growth, and Induced Travel: A Path Analysis* (Spring 2003) 69 APA Journal, No. 2, pp. 145-163; Noland, *Relationships between highway capacity and induced vehicle travel* (2001), 35 Transp. Res. Part A: Policy and Practice, Issue 1, pp. 47-72.)

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should compare the anticipated effect on GHG emissions of this planned prioritization of the use of these revenues to the anticipated effect on GHG emissions of an alternative that applies a significant percentage of HOT lane revenues to unfunded transit needs as the revenue is generated (rather than after the HOT network is completed). In particular, the EIR should evaluate the benefits of using HOT lane funds for transit improvements that would maintain and increase transit ridership in the completed HOT lane corridors.³¹

3. ***The projected effects of the different alternatives on VMT and GHG emissions.*** In addition, the DEIR should provide and evaluate at least one alternative designed to maximize the reduction of GHG emissions. As you are aware, there are many policies and/or projects that MTC could consider to help achieve this goal, some of which it is already considering and could fund at a significantly higher level. While this letter is not intended to provide a complete list, some of the possibilities include the following: focus on eliminating transit shortfalls; increase service capacity to meet increased demand for public transit in core urban areas; increase funding for transportation infrastructure to serve infill and mixed use development located near employment centers and provide incentives for such development; increased incentives for use of public transit, ridesharing and carpools; and expanded public transit frequency of operation.
4. ***Green Construction Policy.*** To further reduce the impact of the projects in the Proposed Transportation Plan on air quality and climate change, the EIR should evaluate the effect of including a mandatory “green construction” policy. Such a policy could require, for example,
 - use of an emissions calculator in the planning of every construction project, one that uses the proposed equipment fleet and hours of use to project nitrogen oxides, particulate matter, and carbon dioxide emissions, then quantifies the reductions achievable through the use of cleaner/newer

³¹ The way the revenue is used could impact the effectiveness of HOT lanes. (See Dahl, R., *The Price of Life in the Fast Lane* (December 2003), 111 Environmental Health Perspectives, Number 16, available at <<http://www.ehponline.org/members/2003/111-16/spheres.html>> [as of September 29, 2008], citing the transportation director of Environmental Defense, who stated that “[t]he key element for truly effective congestion pricing [] is dedication of HOT lane fees to public transit and public health purposes in the same transit corridor.”) Along similar lines, the California Air Resources Board’s Draft Scoping Plan identifies congestion pricing as a GHG-reduction measure under consideration, emphasizing that the GHG emission reductions would come from “relief of severely congested traffic, some reduction in vehicle travel, and from the investment of funds in transit infrastructure that would provide additional transportation options during congested hours.” (Draft Scoping Plan p. 38 [emphasis added].)

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equipment;³²

- that all off-road construction vehicles be alternative fuel vehicles, or diesel-powered vehicles with Tier 3 or better engines or retrofitted/repowered to meet equivalent emissions standards as Tier 3 engines;³³
- use of the minimum feasible amount of GHG-emitting construction materials (cement, asphalt, etc.);³⁴
- use of cement blended with the maximum feasible amount of flyash or other materials that reduce GHG emissions from cement production;
- use of lighter-colored pavement with increased reflectivity, which reduces the “heat island” effect;
- recycling of construction debris to maximum extent feasible;
- planting of shade trees in or near construction projects where feasible.

Finally, the DEIR also should consider feasible measures to mitigate and/or reduce emissions of criteria pollutants (including black carbon and other particulate matter) from diesel buses, such as requiring retrofitting of diesel buses with particulate traps, replacing diesel buses

³²The calculator used in the Sacramento Metropolitan Air Quality Management District’s program is available at <<http://www.airquality.org/ceqa/index.shtml#construction>> (as of September 29, 2008).

³³Similarly, the South Coast Air Quality Management District has called for the State, in selecting projects that will be funded from Proposition 1B, to impose a condition that requires “use of lowest emitting construction equipment and fuels available.” (South Coast Air Quality Management District Res. No. 07-07 (April 6, 2007), “Resolution Expressing Conditions for Funding Projects with Proposition 1B Funds in the South Coast District.”)

³⁴A new production method known as “warm-mix” asphalt technology that significantly reduces GHG emissions during application may prove to be a feasible alternative road paving material. (See Moore, *Warm-Mix Asphalt (WMA) Potentially Can Provide Important Benefits for Paving Contractors, Reduce Fuel Costs and Diminish Green-House Gases*, Construction Equipment (March 1, 2007), available at <<http://www.constructionequipment.com/article/CA6421459.html>> [as of September 29, 2008]. Warm-mix asphalt was used successfully in Yellowstone National Park in August 2007, and, this fall, Logan International Airport in Boston will become the first in the U.S. to pave a runway with the new asphalt mix. (See “*Green*” *Asphalt Saves Energy and Reduces Greenhouse Gas Emissions* (August 6, 2008), available at <http://fypower.org/news/email_story.html?post_id=3165> [as of September 29, 2008]).

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with the lowest-emitting available alternative fuel buses, requiring that all new buses have the lowest level of emissions feasible, and planting particulate-absorbing trees near freeways and busy streets. Emissions of these pollutants is a critical health issue for the region, which does not meet attainment standards for ozone and particulate matter.³⁵

Global warming presents California with one of its greatest challenges to date. MTC has the opportunity to take steps to address the problem of climate change constructively, while educating the public and decision-makers. We urge MTC to meet the challenge with the Proposed Transportation Plan and DEIR. Please do not hesitate to contact us if the Attorney General's Office can be of any assistance.

Sincerely,

/S/

LAURA J. ZUCKERMAN
SANDRA GOLDBERG
Deputy Attorneys General

For EDMUND G. BROWN JR.
Attorney General

³⁵See generally, e.g., California Air Resources Board, Health Effects of Diesel Exhaust, available at <http://www.oehha.org/public_info/facts/dieselfacts.html> (as of September 29, 2008); California Air Resources Board, Draft Diesel Particulate Matter Health Risk Assessment for the West Oakland Community (March 19, 2008), available at <<http://www.arb.ca.gov/ch/communities/ra/westoakland/westoakland.htm>> (as of September 29, 2008); and the Bay Area Air Quality Management District's air quality summaries, available at <http://www.baaqmd.gov/pio/aq_summaries/index.htm> (as of September 29, 2008).

COMMENTS SUMMARY FROM EIR SCOPING MEETING MARCH 10, 2008

GREG HARPER

Director of AC Transit, Member of ACCMA, Representing Beverly Johnson and Mark Green

Also submitted written comments/background material at the meeting

(SM-1) Trying to bring attention to what we consider to be the most environmentally unjust situation in the Bay Area, and perhaps the country. There are 50,000 miles of interstate free-ways; 7 miles within the City of Oakland are banned to trucks (580). As a consequence, all the trucks from the Port of Oakland that have to get to Altamont Pass or south have to take 880. The average speed on 880 is 25 miles per hour. The first two lanes consist of a wall of trucks. We have to make 880 faster for trucks. We are also killing the people of east Oakland. The emissions in East Oakland are horrendous; asthma rates are high, and they map the route of 880 exactly. The highest particulate matter distribution in the Bay Area was on the 880 corridor; the highest asthma rates are in the 880 corridor.

This is because of politics. The people who live in the 580 corridor have more politically influence than those who live in the 880 corridor; [the former] are more successful at resistance to truck access. The fact that there is a significant impact that is unjust is unbearable. We would like to see through your mandatory evaluation, the inclusion of a reasonable alternative with respect to equity that says trucks can go on 580. 580 is perfectly capable to handle trucks. You need to look at the environmental impacts of this new truck distribution, and [the impacts] should be reduced. The reason there are so many emissions is because trucks can't get out of second gear on 880. Also, the accident rate on 880 is higher than on 580. Caltrans has special restrictions on 580. This change would save 350 million dollars this year.

MICHAEL SARABIA

Representing self

Also submitted written comments at the meeting

(SM-2) When the acceleration of global warming becomes real and accepted, then some drastic measures will be required, because easy ones were not taken when they should've been done. BART should go all electric.

(SM-3) (building on Greg Harper's comments) The same thing was found in LA a long time ago. Homes along highways have a higher rate of all kinds of diseases. If Oakland had a tunnel like they do in Europe, through the hills to Altamont, that could alleviate the problem.

(SM-4) Would MTC be subsidizing cities with respect to smart urban development? I think it's a good idea. Some cities are allowing housing on top of the hills. We should limit the amount of development in the hills to fewer or zero, to reduce driving.

(later comment) Pending change in government may affect the work. There will be pressure on MTC to stop using diesel fuel.

(SM-5) (later comment) We need another Transbay tunnel to link the three airports of San Jose, San Francisco and Oakland. This will add security to BART and the airports.

GREG THOLEN

Bay Area Air Quality Management District

(SM-6) It would be appropriate to analyze the air quality impacts associated with construction and the diesel particulate matter change over the entire system. You should identify areas in existing communities within 500-ft or impacted with diesel PM along freeways.

(SM-7) The EIR should analyze the impacts of climate change on the new and expanded facilities, e.g., rising sea level. Are you planning to quantify changes in GHG emissions? (Staff: Yes) Have you sent a level of significance criterion? (Staff: No criterion developed yet) I would encourage MTC to review letters from AG's office with regard to GHG and significance. It is recommended that the lead agency determine significance.

ROBERT S. ALLEN

Retired BART Director, representing self

(SM-8) MTC could reduce truck traffic by working with Union Pacific to get truck cargo on rail, running on the Mococo line (waterlevel line). This would reduce the exhaust that comes as a result of trucks climbing grades.

MTC should work with Caltrans to get a freeway from 580 to 5 west of Tracy, in the Antioch/Pittsburg area; median should be wide enough to accommodate BART.

580, Rt 4, 80 should be widened, via condemnation, so median can accommodate BART at grade. This would make it only \$12.7 million per mile for track work, does not include stations, land, and freeway construction. At-grade alignments are cheaper (\$180 million per mile for SFO tunnel; \$36 million per mile for Dublin/Pleasanton route) Subways and air structures are tremendously expensive.

Encourage MTC and Caltrans to preserve ROW for widening freeways at median in 580 between Hacienda and Greenville Road.

Put BART in El Cerrito and Crockett area by putting BART in 80 median.

Provide ROW for double or triple tracking along the Capital Corridor Line; ultimately, Capitol Corridor should be part of High-Speed Rail system.

Stop spending \$ on Union City intermodal. Colliseum area can be multimodal. Grade crossing are dangerous, and in the Colliseum area there is less traffic and fewer pedestrians along the Mulford Line compared to the Dakota Line. If High Speed Rail is approved, it can connect San Francisco, Oakland, and San Jose, and their airports. If a grade-separated line is built, consider making the existing line from Santa Clara to Millbrae a new BART line (instead of Caltrain). If BART ringed the Bay, it would be a more integrated system.

Grade separations are vital. Secure ROW for rail transit should be included. There should be a West Oakland bypass for BART along 880 over to the transbay tube. This is an ideal location for HSR intermodal.

ROBERT IKENBERRY

Construction industry, representing self

(SM-9) How are you looking at broadstroke policies? Seems like you need to look at specific projects to see the impacts. There are various kinds of impacts associated with transportation projects. How are the projects for the RTP chosen? Are transportation projects evaluated for environmental impacts only after the agencies have prioritized them?

ROBERT JENSEN

Architect, representing self

(SM-10) For the nodes in the transportation system to be effective, there needs to be high density around them (housing or businesses). Some of the existing BART and Caltrain stations are surrounded low-density development. If you go forward with the existing and new systems, it is desirable to have high density around stations; you should establish density targets.

(SM-11) In the EIR, there should be a qualifier to the neighborhood disruption significance criteria that disruption in low-density neighborhoods may be ok if the goal is have to higher density growth.

CALTRANS

(SM-12) We will be submitting a compilation of written comments coming to District 4 by the March 21 deadline. We would like to highlight the requirement of SAFETEA of early consultation with resource agencies and early environmental scans to determine fatal flaws with projects.

GENERAL INQUIRY ON COMMENT FORM

Anonymous

(SM-13) "Evaluation of a program EIR without specific projects seems difficult and/or providing little meaningful data. EIR evaluation of specific projects focuses on their impacts to the exclusion of other options. How does MTC address this potential chicken and egg problem? Please provide some general overview of how MTC will approach programmatic priorities to define and meet 2035 goals."

COMMENTS SUMMARY FROM EIR SCOPING MEETING MARCH 13, 2008

RON BISHOP

AIA, representing self

- (SM-14) Want to see more firm concrete solutions to link transport to land use
- (SM-15) Need to pay more attention to pedestrians/bicyclists' safety, especially with facility transition (e.g., freeway off-ramps)
- (SM-16) Need to reduce noise from construction and everyday drum off sound walls (Sound walls do not absorb sound, the sound just bounces off)
- (SM-17) Need to integrate housing, jobs, retail – village approach; will reduce VMT
- (SM-18) Cannot deny children the opportunity to walk or bike to school (e.g., Highway 24)
- (SM-19) Cannot do a bus or pedestrian improvement unless you include bicycles or cars – integrated planning.
- (SM-20) Will we continue to dig huge tunnels through the hills?
- (SM-21) Does not want to see projects like Leona Quarry, which is one big housing division that you cannot get a cup of coffee in.
- (SM-22) Need to make sure that people are driving only 25 mph in school and residential areas.
- (SM-23) Need to calm all on/off ramps for a distance of 1 mile.
- (SM-24) Make all on/off ramps for pedestrians and bicycles enticing.
- (SM-25) Take concrete actions to improve multi-modal access, such as bulb-outs, bike lanes, good sidewalks, and cross walks.
- (SM-26) All new major projects must include multi-modal access.
- (SM-27) Need to call for a reduction of noise, light, water, and air pollution
- (SM-28) 2009 TIP needs to provide a balances/ not motor vehicle consideration.
- (SM-29) New land use near on/off ramps should be evaluated for relocation.
- (SM-30) Sound-caps on BART wheels.

STEVE LOWE

Belongs to the West Oakland Community Association, West Oakland Project Area Committee, West Oakland Community Advisory Group, West Oakland Toxics Reduction Collaborative, West Oakland Environmental Indicators Project, and serves as a co-convener on the Mayor of Oakland's Port Task Force.

Written on comment form:

(SM-31) [I] feel that MTC has been supremely non-responsive and/or ignorant of West Oakland and needs, startling, in view of the fact that the most congested and polluted hub in the Bay Area is West Oakland.

As WOPAC has a transportation committee, those of us who serve on it are surprised that MTC, with all of the traffic that is routed through both the port and the maze, regards this low income, chronically depressed area with virtually no concern whatsoever.

Decisions to route high speed rail away from Oakland and rectify, thereby, years of abuse of the rights of way (that MTC has oversight of) is a demonstration of the agency's disregard of west Oakland and the other poor communities in the Oakland-Richmond corridor.

Oral Statements:

- MTC's disregard for West Oakland is pretty much evident
- No improvements in West Oakland v/v transportation planning
- Too much congestion occurs in West Oakland. When will MTC meet with them?

DAVID SCHONBRUNN

Representing TRANSDEF

(SM-32) We are developing a revised alternative for this EIR. Some of the Plan goals are compromised by projects that end up in the preferred alternative. Highway projects increase VMT and emissions. We propose an alternative that would investigate other policy scenarios to reduce VMT and emissions.

This alternative will represent a different way of approach the plans goals. This is a way for providing needed funding.

In 2003 our alternatives saved 6.3 billion dollars.

With the vast array of needs for money, an alternative that's focused on intensive cost effectiveness should be taken a look at.

This alternative would provide a local example of national policy recommendations --- clean slate, performance based projects.

Under CEQA a lead agency is required to study feasible alternatives. If decision-makers decided that moving in this direction was the right thing, they could seek consensus on it.

The kinds of things we are recommending are totally feasible. Other reasons to run this alternative – in the 2005 EIR there was no interregional model for transit-.. that model has been developed. Those outputs can be used to show ... CV to Silicon Valley.

(SM-33) Change in projections from 2003, and intensified land use, there is no need to use a separate and distinct land use basis to model the TRANSDEF alternative.

Staff costs should be extremely low – you already have our network coded. If you are using the same land use and pricing assumptions, all you need to do is input any changes we recommend. We are not suggesting changing pricing because of the very interesting pricing alternatives that were studied in the scenario process.

(SM-34) Pricing sub alternative we would like to see done --- against all alternatives – specifically, a freeway congestion pricing alternative replacing the concept of HOT lanes. They are an interim and mediocre step. An alternative needs to be tested that looks at the benefits of reducing congestion and emissions directly. HOT lanes the public is not going to get. Does not want to see HOT Lane alternative.

We want to see a freeway congestion pricing sub alternative run on all the EIR alternatives. Right now I am working on the outputs from the model run in 2004 of our alternative to see if there is any additional transit service or routes that we should add to our network that would improve overall performance. We believe the cost to doing this model run is minimal. Very important information will be developed for policy makers. It is incumbent on MTC to study this as a lead agency.

COMMENTS SUMMARY FROM TRIBAL CONSULTATION

THE FEDERATED INDIANS OF GRATON RANCHERIA, MARCH 21, 2008

Nick Tipon, Chairman of the Sacred Sites Committee

Caltrans and MTC representatives also in attendance

We have been meeting with Caltrans for two or three years now on a quarterly basis. We've established a relationship of trust. We get to provide input early on. They have accessible personnel.

Our tribal lands include Marin County to the Golden Gate Bridge, to the Russian River, the Napa/Sonoma County Line, and even 100 feet of Angel Island. There is a report coming out that proposes the Miwok ranged far down the Peninsula, too. We have place names for villages in Napa, but other tribes do not necessarily acknowledge them. Our territory map is a political map, it is hard to say.

We have a demographic map of tribal members. Our tribal territories are where we lived for 10,000 years. There are some very large village sites near the coast. 101 was kind of the trail, San Raphael, Alameda del Prado... villages tended to stay out of the valley floor, up a little bit. The San Francisco Bay wasn't really there 10,000 years ago; what today is water was once village sites.

At one point, the tribe only had 14 people left (the mid-1800s). The Tribe was restored in 2000, and currently has 1,100 members. There are seven elected tribal council members. Council members sit for two-year terms. We have our own offices that do housing, social work, EPA. We have a proposal to do a Casino, with access via the Rohnert Park Expressway, Wilfred Avenue Overpass, and SMART rail if that ever happens. We own 1,500 acres back there, but the Casino will only sit on 30.

We are looking for regular, reliable consultation opportunities. How do we make decisions at the visionary stage [rather than the project implementation stage] to protect resources?

The best mitigation [of impacts to cultural resources] is avoidance. Designate these areas as open space. If necessary, you can cap the ground with sterile soil, and then pave over it (no digging).

Another concern is native plants. Companies that are hired to do cultural resources surveys don't do native plants. They don't know what these plants are.

The EIR can specify that tribes should be contacted for surveys of cultural resources so they can provide information on native plants, or other sites that are unlisted or only known to the tribe. Caltrans works with the tribe on the things they can't see on the ground. (place names, etc) In the case of the Narrows project, Caltrans has correspondence going back to 2001... a lot of meetings and time, but it is worth it.

We've established regular meetings now with the Army Corps of Engineers, Fish and Game, State Parks, County Planning, some specific cities, the area contingency plan, to improve con-

sultation at all stages of the process. We are beginning meetings with the National Parks, Coast Guard. One of the things we asked Army Corps was to send us a list of all the permits they've granted in our territory, so we can determine if they impact sacred sites. The Native American Heritage Commission (NAHC) is far understaffed. Relying on their manpower to assure consultation occurs is not going to work. So we go agency to agency.

Summary of Suggested Consultation Efforts

Tribal Consultation in General

- (SM-35) Early notification- Everything is up for consultation
- (SM-36) Always consult with tribes individually – because their interests are confidential
- (SM-37) There are existing laws about confidentiality – be sure to follow them
- (SM-38) More follow-up (beyond a mailing) may be necessary to achieve real consultation with other tribes (can't rely on NAHC list alone)
- (SM-39) Program for disposition of human remains – most controversial subject, and different tribes have different preferences. For us, all resources should be returned to the soil, or as closely as possible; work with closest tribal descendent and property owner
- (SM-40) What are the key points in transportation planning processes where this can happen?

Federated Indians of Graton Rancheria

- (SM-41) Regular meetings once a year, or more frequently
- (SM-42) Document evaluation – in particular the cultural resources sections – would like to see drafts before the public review draft EIR if possible
- (SM-43) Input into evaluation plans that archeological firms might use for surveying
- (SM-44) In particular, consultation with contract archeologists/surveyors on native plants identification
- (SM-45) Treatment plan in place prior to hiring an archeological firm, in case something is uncovered
- (SM-46) Consultation related to when to have a tribal monitor in the field along with an archeologist
- (SM-47) Notification even for preliminary engineering studies (any ground disturbance, borings, etc) in case cultural resources are discovered

- (SM-48) Enhance process description in both EIR and RTP if possible – Insert expectations for future - local evidence of consultation with tribes; list steps for getting consultation to happen at the local assistance level (where Caltrans helps local governments to do their projects) – as local governments program their projects, they can also program the appropriate amount of funding for cultural resources procedures and treatments
- (SM-49) Perhaps of the forms that are required for submitted local projects lists, one can be included from the tribes that documents consultation
- (SM-50) Create overlay map of all proposed projects and tribal territory, to review with tribe for important conflicts prior to Project description being defined

Transportation 2035 Plan: Change In Motion

Starting in 2007, MTC is undertaking a major update to its regional transportation, known as Transportation 2035. Unlike recent plans, which focused first on budgets, this effort will define a vision for what the regional transportation network should encompass by the year 2035. Today, the Bay Area has a robust, multi-modal transportation system with local streets and roads; freeways and expressways; bus, paratransit, ferry and rail services; and bicycle and pedestrian paths. These assets are the dividend paid by billions invested over several decades; money used for maintenance, operation and strategic expansion of the regional transportation network. Each of these assets is precious.

Now we must choose how our region grows and how our transportation network supports this growth. Our fundamental challenges will in many ways continue to center around how to keep our roads and transit systems in good repair, how to squeeze more efficiency out of our system, and how to build the most cost-effective new infrastructure where needed. But on the horizon are new challenges to meet and new questions that must be answered:

- How should we direct scarce resources to provide the infrastructure to support communities primed for higher housing growth?
- How should we reduce greenhouse gas emissions from transportation sources and respond to the effects of global warming already underway?
- How should we harness the power of the marketplace and cutting-edge technology to deal with congestion?
- How do we make policy and investment choices that yield equitable benefits to all residents?

The Bay Area transportation network is a fortune inherited from previous generations. Now we stand at the proverbial fork in the road. We can continue to live off of our inheritance or establish a new legacy for generations yet to come. We can inspire, innovate and implement an integrated, efficient regional transportation system that is safe, reliable and secure; supports both economic development and focused land use patterns, and makes wise use of our limited resources. A shared vision of the regional future ought to center not just on the past and present but what is possible.

Which Future? MTC, partner agencies and stakeholders are working together to define the various elements of the vision for the Transportation 2035 Plan. To help inform policy and investment strategies for the vision, MTC staff proposes to assess three different investment options in terms of their ability to support the regional future growth.

- How should we direct scarce resources to provide the infrastructure to support communities primed for higher housing growth?

Higher Housing growth will return in a few years, after the Recession, by 2010? Locally, about the same time there may rapid growth due to the sale of commercial sites at the Concord Naval Weapons Station, right next to No. Concord/ Martinez BART Station -That is BART foresight!

- How should we reduce greenhouse gas emissions from transportation sources and respond to the effects of global warming already underway?
- ✓ Switch more busses from gasoline to hybrid power, with small, constant speed, gasoline engine to provide electricity to drive a short distances at city speeds to reach **Park and Ride** Lots, Bus Tramway electric power lines, Bus Stops and BART Stations. San Francisco Muni is far along.

SM-51

- SM-52 ✓ Prepare plans to provide cargo service within major cities like San Jose, San Francisco and Oakland. The current BART cars that will be replaced with new ones with more doors, could be refurbished to carry cargo by removing the seats. The cars would run during off-peak hours to consolidating stations where local delivery could be provided by one contractor, like FedEx, UPS, etc. Alternative: Build a new expensive network -Amsterdam is doing that.
- SM-53 ✓ Support the ban of hillside housing, top of a hill housing, very low density housing and the like. To clarify the intent, the ban should be based on distance and change in elevation from a main highway to a home. This kind of housing will provide far more emissions that would be best allocated to electric power plants. In 10 years, the use of coal to make electricity will be banned. California is blessed in that we have a lot of geothermal power available, wind power and people willing to put solar panels in every home. Actually, our nation is blessed, the EPA found that N. Dakota, Kansas and Texas, alone, have enough wind currents to run all the windmills needed to supply electricity to for all the USA. This finding was made in 1991 but may have not been noticed until fairly recently.
- SM-54 ✓ For Bay Point to Antioch: The current Tri-Delta Limited stop bus routes 300 and 200 works very well. The new bus route 201 seems to be slow in growing, but since gasoline prices reach \$4 and \$5 dollars per gallon (already seen in a few stations) more people will switch to the bus and BART services. The new BART train frequency of 15 minutes, no doubt, will help a lot.
- SM-55 ✓ Keep the BART system fully electric, avoid alternatives that, when Global Warming is proven, will be prohibited and require a return to electric power. While the cost of producing electricity from burning oil has increased with the cost of oil, the "so-called" Peak Oil Production, on a per Capita basis, was reached in 2006. From here on out, we are at the mercy of scarcity and greed. It may be that the wealth implied in coal mines and oil fields will never materialize when our country signs the next Kyoto Treaty II with mandated reduction of emissions to 1990 level.

Price of Electricity. The cost of electric power from windmills dropped from 39 Cents per Kw-hr to Three (3) Cents per Kw-hr, while the price of an oil barrel went from \$10 to over \$100. The prospect of solar cells does not appear promising. The January 2008, Scientific American had a plan that, if the U.S. Government invested \$420 Billion in ten years, the price of electricity from solar panels could come down to Six (6) Cents per Kw-hr. *Why would anybody want to do that?*

- How should we harness the power of the marketplace and cutting-edge technology to deal with congestion?

SM-56 ✓ Where practical, use contractors for temporary or non-critical tasks that can be managed by staff not under direct supervision of MTC and BART Managers and Directors.

SM-57 ✓ Consider using a local cargo delivery contractor in a local area to deliver cargo from the BART cargo station, above or below ground level, to their known local customer. Alternative: Contract the overall task with experienced managers, like FedEx, UPS, etc., they are familiar with the tasks and may derive economies of size by including their deliveries to these places.

- How do we make policy and investment choices that yield equitable benefits to all residents?

SM-58 **Switching from cars to bus and BART is a major transition, as much as you can, keep fares low and frequencies high, even if it "uneconomical" in the transition. The use of oil, gasoline and coal will end due to either raising scarcity and cost or EPA regulations.**

Future Regulations. Amsterdam found 35 % of the city air pollution came from trucks and it is implementing an all-electric cargo rail delivery system (outline on next pages).

Light ideas for urban freight



While some European cities have adopted cargo tram as a means of transporting specific commodities, the idea of setting up logistics networks using light rail remains relatively unexplored. But as **Keith Barrow** discovers, Amsterdam is embarking on a bold plan that could offer a very attractive and sustainable alternative to city centre road deliveries.

MORE THAN 100km of light rail lines thread their way through the streets of Amsterdam, carrying 244 million passengers per year to almost every district of the city and helping to keep its historic centre relatively car free. But there are some who believe this extensive network has the potential to do a lot more, by removing lorries from the city centre.

Amsterdam city centre has suffered chronic problems with access for lorries because of its narrow streets, which often makes deliveries difficult and disruptive. Goods transport within the city is restricted to a brief period between 07.00 and 11.00, forcing hurried deliveries and trundling traffic

congestion in the morning peak. Furthermore, an action plan for air quality published in 2005 noted that more than 35% of emissions in central Amsterdam come from road freight transport.

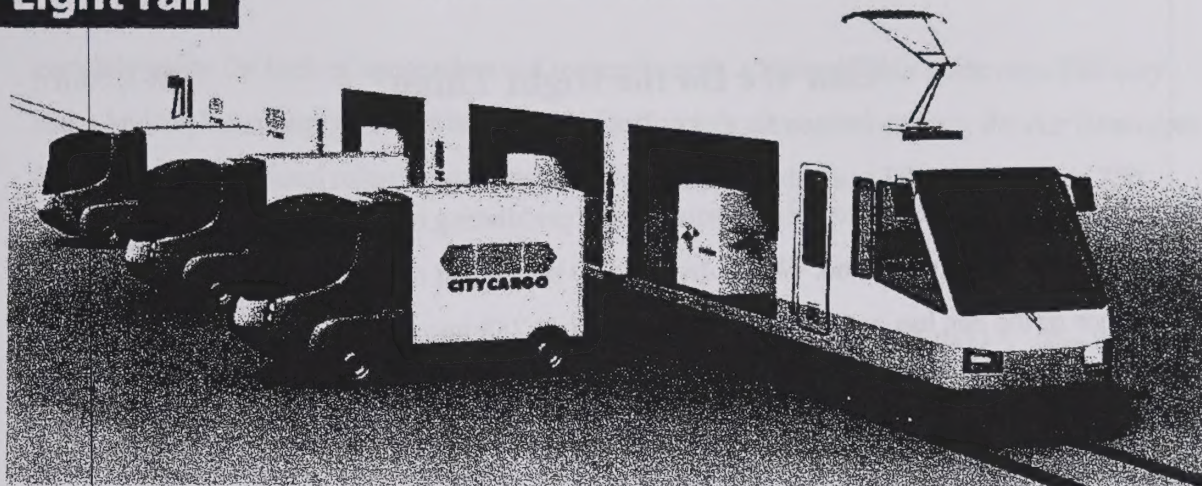
Local entrepreneur Mr Peter Hendriks spotted a potential solution to the problem during a visit to the Volkswagen plant in the German city of Dresden, where purpose-built light rail vehicles (LRVs) have been transporting components between the logistics centre and production sites since 2001. City Cargo Amsterdam, the company set up to operate the cargo trams, subsequently drew plans to bring the concept to Amsterdam and in November 2006, the city council

approved a four-week pilot project.

This small-scale trial ran in March this year using two LRVs loaned by Amsterdam Municipal Transport (GVB). During the trial, trams were loaded from lorries at Luttmeerpolder, near the terminus of Line 1 in Osdorp, before running to two transfer points between Plantage Parklaan and Frederiksplein, where the freight was offloaded onto electrically-powered road vehicles for the remainder of its journey to the customers' premises. For the first two weeks the trams ran empty to assess the impact on traffic patterns. During the final two weeks of the trial, the trams operated with customers' freight that normally would have been delivered by road. The trial was deemed successful enough for the city council to grant City Cargo Amsterdam a 10-year concession to operate cargo trams on the GVB network on a commercial basis from next year.

Under this concession, City Cargo Amsterdam must operate without any subsidy from the municipality or central government, and has to guarantee that GVB's passenger

Light rail



Freight will be transferred from the cargo trams to the electrically-powered E-cars at dedicated hubs around the city.

operations will not be disrupted by its activities. An operational agreement has been signed with CAVB to honour this, although City Cargo Amsterdam says that because cargo trams are not tied to specific routes, they can often avoid the busiest parts of the network. Furthermore, most routes have spare capacity and cargo trams will simply travel between CAVB services.

Numerous customers

Unlike the Dresden operation, City Cargo Amsterdam will serve numerous small customers such as shops, restaurants and supermarkets, which traditionally have had little choice but to use road deliveries.

The cargo trams will operate from

distribution centres, called cross docks, situated on the outskirts of the city close to the highways that radiate from Amsterdam. These cross docks will be supplied outside peak traffic hours, and are located to ensure traffic avoids the congested A10 orbital highway.

Freight will be unloaded from lorries and grouped by destination before being loaded in containers onto cargo trams. These will deliver the freight to dedicated sidings at inner city transfer hubs, where freight will be transferred into small electrically-powered road vehicles called E-cars, which make grouped deliveries to customers within small areas of the city centre. Each cargo tram will run between two cross docks serving a series of hubs en route.

Even with the need to transfer freight

between modes, City Cargo Amsterdam says this method of delivery will be faster than using road vehicles for city centre delivery because the cargo trams are virtually unaffected by road congestion. It also believes the capacity to deliver 24 hours a day seven days a week, and the bundling of freight by destination to make more efficient use of transport resources, will give it a significant competitive edge over road transport and bring costs down. In the longer term, City Cargo Amsterdam argues that centralised storage distribution and collection of goods will improve the efficiency of freight in the city centre.

Around €150 million is being invested in the initial phase of the project, which includes infrastructure modifications, cross dock and hub construction, and the purchase of 10 cargo trams. City Cargo Amsterdam says it is at an advanced stage of developing the specification for the 30m-long cargo trams, which must each have a capacity of 30 tonnes, and it expects to publish a tender soon for the first 10 LRVs. Up to 53 cargo trams could eventually be ordered, operating from four cross docks and serving 13 hubs.

The potential of the project is immense - City Cargo Amsterdam says that half the 5000 daily lorry movements in the city centre could be eliminated, with a reduction in particulate emissions of up to 1g/l. The success or failure of cargo trams in Amsterdam will doubtless determine the future of the concept in other cities, where the presence of a comprehensive light rail network could offer a golden opportunity to curb emissions and congestion caused by lorries. **IRJ**



Can We Do the Right Thing?

SM-1, cont'd

We can no longer ignore the consequences of prohibiting heavy trucks on the 11 mile section of I-580 through Oakland. While driving 580 is safe and congestion free, the probable consequence of the ban has been to turn I-880 and Route 238 into an airborne Love Canal with a soaring accident rate.

From Oakland, trucks headed to the Tri-Valley and I-5 are forced onto the same freeway as those headed for Silicon Valley and Highway 101. Consequently, the two right lanes of 880 are jammed with heavy trucks crawling at a stop and go pace. At San Lorenzo, they take 238 to finally get onto eastbound 580, where the congestion is even worse as they merge with traffic from the San Mateo bridge and northbound 880. The same problem happens in the reverse direction. Last year, the average afternoon speed through this corridor dropped by over 25%, and now barely averages 20 mph though much of it. As a result, the 880-238 corridor lags only I-80 from Albany to the Bay Bridge and I-580 in the Tri-Valley as the most congested freeway segment in Alameda County.

Attempting to stay ahead of this problem, the County Congestion Management Agency has poured almost one hundred million dollars into "improving" the 880-238 corridor, with hundreds of millions more planned, all to little avail as revealed by its own study. But the questions never asked are how much of this problem is political; how much money could be saved if the truck ban were removed; and what is the impact on the safety and the health of the people who drive the 880 corridor.

The truck ban goes back 40 years. Originally scheduled to be lifted in 1968, local pressure convinced Governor Reagan to leave it in place. Despite the Port's complaints of the strain on its operations, efforts to study the ban, most recently by CalTrans in 1997, have been stymied by local officials who maintain that it is purely of local concern and their preference.

Who benefits from that preference is obvious. People living along the 580 corridor

certainly enjoy the lack of congestion and reduced noise. Concentrating noise onto 880 may seem logical, but a heavy price is being paid. California's air control agency, the Air Resources Board, states that diesel exhaust contains over 40 toxins that damage DNA and causes 250 cancers per year.

Worse, diesel exhaust is a major source of fine particulate, called PM2.5. The 2.5 refers to the maximum diameter of the particulate in microns (millionths of a meter, 2.5 microns is about 1/30th the diameter of a human hair). The state Air Board estimates that PM2.5 reduces life expectancy in California by 1.5 years. PM2.5 shortens the lives of those who die from lung ailments or heart disease (including heart attacks), by 14 years. By age 18, 7.9 percent of all children exposed to high levels of PM2.5 have permanently underdeveloped lungs as compared to 1.6 percent of the children in other areas.

While all PM2.5 is inhaled deeply, most diesel particulate is the component of PM 2.5 that is less than 1 micron in diameter. This "ultra-fine particulate" or PM1 reaches the deepest parts of the lung and dissolves the toxins clinging to it into the fluid lining the airways. One study found that children riding diesel buses to school were exposed to three times the level of ultra-fine particulate as those who walked. Other studies cited by the Air Board found that 30 to 55 percent of the average Californian's exposure to diesel particulate occurs on the road, despite spending only 6 percent of their time there. That's the average road, with average truck traffic. Imagine the dose someone gets sitting in stop and go traffic next to two lanes of diesel trucks on 880 or 238.

The lower-income, non-white population along the 880-238 corridor, compared to that of 580, gives rise to civil rights and environmental justice issues that both the Congestion Management Agency and the Bay Area Air Quality Management District need to consider if the truck ban is to be maintained. The state Air Board cites studies showing that elderly people living near major highways have twice the normal risk of dying from cardiopulmonary diseases.

However, once aloft, fine particulate stays suspended for hours and drifts miles in the

wind, according to the Bay Area Air Quality Management District. With the prevailing wind off the Bay, the further inland that diesel emissions take place, the less damaging they would be to the health of the people of Oakland, especially given the reduced overall emissions from the better flow of truck traffic in both corridors.

Finally, the commonly realized effect of the truck ban is the fear of driving on 880 or 238. That fear is well founded. According to the Congestion Management Agency, accidents per vehicle mile on 880 are 50 percent higher than on 580, having increased 25 percent over the past six years while those on 580 have decreased. Accidents on Route 238 are 250 percent higher than on 580.

The County Congestion Management Agency and the regional Metropolitan Planning Commission have begun revising their transportation plans. That planning should be done in the light of having comprehensively studied the effect of the truck ban on 580. That study could reveal unanticipated aspects to this issue. Some say that truckers might prefer the fewer curves and hills of 880-238. If so, lifting the ban would result in little change to the status quo. Perhaps the study will indicate that lifting the ban just during mid-day would alleviate much of these problems.

Even if the study reveals that the consequences of the ban are less dire than presumed here, at least we will know something of the real costs of the policy and be able to say that knowledge as well as politics is guiding it.

Mark Green

Greg Harper

Mark Green is Mayor of Union City and serves on the Congestion Management Agency, the Alameda County Transportation Authority and the Transportation Improvement Authority.

Greg Harper is a Director of AC Transit and a member of the Congestion Management Agency. From 1991-1999, he served as a director of the Bay Area Air Quality Management District

CALIFORNIA INTERSTATE ROUTE 580

"MacArthur Freeway"

SM-1, cont'd

SPECIAL RESTRICTION HISTORY

LOCATION

This weight restriction is an 8.7-mile segment of Route 580 from Foothill Blvd. in San Leandro to Grand Ave. in Oakland (PM 34.89 to 43.76 in Alameda County).

RESTRICTION

"No trucks over 9,000 pounds, except buses."

HISTORY

1951 - Truck traffic is prohibited on MacArthur Blvd.

1963 - Oakland City Ordinance #6789 passed June 13, 1963, amending Sections 205 and 206 of the Oakland Traffic Code. This ordinance prohibited vehicles exceeding 4.5 tons, except for passenger buses and stages. The ordinance included a provision placing the ban in effect until January 1, 1968, pending approval of the federal Bureau of Public Roads (now known as the Federal Highway Administration - "FHWA") and the California State Department of Public Works, Division of Highways (now known as the Department of Transportation - "Caltrans"), unless repealed by the City Council of Oakland.

1963 - This ban was approved by Caltrans and FHWA when 580 was constructed (approximately 1962-1964), in part because there was a pre-existing truck prohibition in this corridor before the freeway was built. Secondary issues included a four percent grade which would add to congestion and noise. The ban was to continue until January 1, 1968.

1965 - The new segment of I-580 was completed and open to traffic.

1967 - The Cities of Oakland, Piedmont, and San Leandro, and the County of Alameda sent a request to then-Governor Reagan to renew the State's approval of the truck ban.

1967 - The Department conducted an extensive study to verify that an alternate route, Routes 238 and 880, was available for use by trucks. The study concluded that, from a traffic engineering standpoint, there was no strong evidence either to retain or to terminate the truck ban. So the truck ban was retained. According to the report, two factors justified retaining the ban: (1) the longstanding ban of trucks in the area, and (2) no hardship or added cost would result in the diversion of "through" trucks at this location. The report recommended the approval of the truck ban be extended indefinitely. However, the Department intended to review the operations of the alternate routes, 238 and 880, periodically to determine the desirability of continuing the ban.

1968-1972 - This review occurred annually until 1972 when HQ Traffic informed the District that future reviews were unnecessary.

1982 - The federal Surface Transportation Assistance Act (STAA) passed, which transferred the authority over truck bans on the National Truck Network from Caltrans to the U.S. Department of Transportation (US DOT).

1990 - After the 1989 Loma Prieta earthquake, some trucks began using I-580 for emergency purposes and/or due to increased congestion on I-880. Oakland residents complained to their elected representatives. The California Highway Patrol increased enforcement of the ban.

1990 - The California Trucking Association (CTA) proposed to study lifting the ban as part of Caltrans District 4's I-880 corridor study. Caltrans District 4 refused to add this study due to strong local opposition.

1996 - In December, the CTA requested that Caltrans perform the "periodic" review intended by the 1967 study.

1997 - Caltrans determined that a "reverse" truck ban would require the same steps as a truck ban, that is, local agency support (Cities of Oakland and San Leandro, and Alameda County); a traffic study to evaluate traffic, safety, noise, and air quality impacts; an environmental document; a public hearing; and also federal approval, because of the 1982 STAA re. truck bans on interstates.

1999 - Caltrans District 4 proposed to Caltrans HQ that the district initiate the study, and invite the City of Oakland, the Alameda County Congestion Management Agency (CMA), and the CTA to participate. They proposed that, if the study results were favorable towards lifting the ban, and IF the City of Oakland was not opposed based on the report data, then Caltrans would proceed to the California Transportation Commission (CTC). HQ concurred.

1999 - On May 11, the Oakland City Council passed Resolution No. 74985 affirming the prohibition of trucks on the I-580 Freeway in Oakland. On the same date, several members of the California legislature wrote to Caltrans requesting that they abandon the study proposal.

1999 - On June 30, Caltrans wrote to the City of Oakland that, as of this date, there are no plans or resources allocated to perform the study.

1999-2000 - On 2/18/99, the California Legislature introduced Assembly Bill 500 to place the I-580 truck ban into the California Vehicle Code (CVC). The bill was chaptered on 8/10/2000, and codified as CVC Section 35655.5.

CALIFORNIA VEHICLE CODE

A portion of the CVC section is copied below:

35655.5. (a) "... no vehicle... with a gross weight of 9,000 pounds or more, shall be operated on the segment of Interstate Route 580 ... between Grand Avenue in the City of Oakland and the city limits of the City of San Leandro. This subdivision does not apply to passenger buses or paratransit vehicles.

(b) The Department of Transportation shall erect suitable signs at each end of the portion of highway described in subdivision (a) and at any other points that the department deems necessary to give adequate notice of the weight limit imposed under this section."

Note: The CVC ends the restriction at the city limits of the City of San Leandro. This location is

Community Air Risk Evaluation Program
Phase I Findings and Policy Recommendations
Related to
Toxic Air Contaminants in the San Francisco Bay Area

September 2006

Bay Area Air Quality Management District
939 Ellis Street
San Francisco, CA 94109

1. INTRODUCTION

1.1 Background

In the San Francisco Bay Area toxic air contaminants* (TAC) are a serious concern, as they are in other major metropolitan areas. The California Air Resources Board (ARB) lists 189 compounds as TAC, including particulate matter (PM) specifically from diesel internal combustion engines; benzene, a constituent of gasoline and a product of incomplete combustion; and 1-3 butadiene and formaldehyde, also products of incomplete combustion. Health risks posed by these compounds include cancer risks; chronic, non-cancer risks, such as diseases of the lungs, liver, and kidneys; and acute risks, such as eye and respiratory irritations. A distinction is made between TAC and criteria pollutants, such as ozone and PM from all sources. Though both types of pollutants can have serious health effects, the regulatory frameworks for controlling them differ.

The Bay Area Air Quality Management District (Air District) currently implements a variety of programs that reduce TAC emissions and exposures. Under State law, the Air District's primary mission is to regulate stationary sources and indirect sources, and, through its regulatory, enforcement, and permit programs, the Air District reduces criteria pollutant and toxic emissions from these sources. Through its grant and incentive programs, the Air District allocates approximately \$40 million in annual funding to provide incentives to reduce criteria pollutant and toxics emissions from on-road and off-road mobile sources. In addition, the Air District has an advisory role on air quality issues related to development, housing, and transportation. The Air District also supports and sponsors legislation to reduce criteria pollutant and toxic emissions from on-road and off-road mobile sources and other sources; develops model ordinances to reduce criteria and toxic pollutant emissions from on-road and off-road mobile sources and area sources; and conducts public information campaigns to increase public awareness of and involvement in pollution reduction programs.

High TAC emissions often occur near communities where, due to age (youth or seniors), high rates of asthma or other medical conditions, lack of medical services, and other socio-economic factors, residents may be particularly sensitive to the effects of TAC. These concerns led to State legislation (AB 1390, Lowenthal) which requires that California air districts with more than one million residents distribute at least 50% of their Carl Moyer Grant funding in such a manner that directly benefits communities with the most significant exposures. These concerns have also underscored the need for the Air District to develop improved tools to map and assess TAC emissions and exposures throughout the region in order to identify areas where emission reduction activities should be focused.

1.2 The Community Air Risk Evaluation Program

The goal of the Community Air Risk Evaluation (CARE) program is to identify locations with high toxic emissions and sensitive populations, and to use the information to help the Air District establish policies for the use of its incentive funding, regulatory authority, and other programs to reduce toxic emissions in areas with high TAC exposures and sensitive populations.

* Key words and phrases are defined in an appended glossary.

In Phase I of the CARE Program, the Air District and its consultants* – with input from CARE Task Force members, including scientists, community groups, and industry representatives – developed a preliminary emissions inventory of TAC and compiled demographic and health-statistics data to help identify locations with high levels of TAC and populations who are especially sensitive to TAC. The TAC emissions inventory is an annual inventory for year 2000 derived using emissions models and engineering calculations. The TAC inventory was displayed on a map of the Bay Area to indicate locations where emissions are highest.

To support the development, refinement, and evaluation of the Bay Area toxic inventory, a number of additional studies were undertaken in Phase I, including a telephone survey of residential wood burning, a carbon-14 analysis to determine new versus old carbon fractions in the ambient air, a chemical mass balance (CMB) study to estimate the source contributions to various ambient PM compounds, and a CMB analysis of organic PM compounds. Such measurement-based studies are helpful to verify that the TAC emissions estimates are realistic. Findings from Phase I are described in Section 2.

Findings from the technical studies will be used to help design measures to reduce exposure to toxic compounds, especially for sensitive populations. Activities to reduce exposure will begin being implemented immediately, as further technical analysis proceeds in Phases II and III. In Phase I, for example, the Air District included in the procedures for its Carl Moyer Program a method to target areas with high PM and sensitive populations. Additional policy recommendations are described in Section 3.

In Phase II of the CARE Program, with continued input from the Task Force, the Air District will work to improve the TAC inventory and begin preliminary modeling to estimate concentrations of TAC in the Bay Area. In Phase III, the modeling of TAC concentrations will be refined and more detailed assessments of exposure will be made using measurements and modeling. Phases II and III are outlined in Section 4.

1.3 Scope and Audience

This document summarizes the findings of Phase I of the CARE Program and presents policy recommendations aimed at reducing health risks from TAC in the Bay Area. This document targets a general audience with concerns about TAC in the Bay Area, as well as policy makers, communities, and industry groups who can use this information to help design effective TAC control strategies. In addition to summarizing Phase I findings and policy recommendations, this document also outlines the goals for Phases II and III of the CARE Program.

* The Air District worked with Sonoma Technology Inc. (STI) to develop a gridded emissions inventory of toxic air contaminants.

2. FINDINGS – PHASE I

2.1 Emissions of Toxic Air Contaminants in the San Francisco Bay Area

In Phase I of the CARE program, an annual emissions inventory of TAC was developed for a 2 by 2 kilometer (approx. 1 square mile) grid system covering the Bay Area. This gridded inventory represents emission levels in year 2000 and includes emissions from individual facilities (point sources), on-road mobile sources, and off-road mobile and other distributed sources (area sources). The compounds included in the TAC inventory are those defined by ARB, including diesel PM and other toxic compounds such as benzene and formaldehyde. In addition to mapping and evaluating them directly, the emissions of each toxic compound were weighted by their toxicity. For example, benzene has a higher cancer risk than MTBE, so it receives a higher weight. The risk-weighted emissions can be compared on the basis of their relative risks.

In the Bay Area, diesel PM accounts for about 80% of the cancer risk from airborne toxics (Figure 1a). This finding is consistent with the findings made by the South Coast Air Quality Management District in the MATES I and II studies and with statewide findings made by ARB. Diesel PM consists of primarily fine particles. In addition to the toxic effects of diesel PM, all fine particulate matter also aggravates heart and respiratory disease, including asthma. Major sources of diesel PM include on-road and off-road heavy duty diesel trucks and construction equipment (Figure 1b). The highest diesel PM emissions occur in the urban core areas of eastern San Francisco, western Alameda, and northwestern Santa Clara Counties (Figure 2a).

The major contributor to acute (short term) non-cancer health effects in the Bay Area is acrolein, a chemical formed from the combustion of fossil fuels and photochemical reactions in the atmosphere. The major contributor to chronic (long term) non-cancer health effects in the Bay Area is also acrolein. Major sources of acrolein in the Bay Area include on-road mobile sources and aircraft (Figure 1c-f). Areas with high acrolein emissions are near commercial and military airports and freeways (Figure 2b).

The emissions inventory of TAC and associated potential health risks estimated in Phase I are the best available estimates for the Bay Area. However, the inventory and estimates of risk should be considered preliminary because they are subject to change as further analysis is carried out in Phases II and III.

2.2 Supporting Studies

To support the development of the Bay Area TAC inventory and to assist in its evaluation, the Air District conducted a number of additional studies. A telephone survey of residential wood burning provided an estimation of total wood burning in the Bay Area that is consistent with previous estimates; however, the study indicated that much less wood burning occurs in San Francisco County than previously estimated and more occurs in Alameda, Contra Costa, and North Bay Counties. A carbon-14 analysis showed that during both summer and winter new carbon (wood burning, forest fires, food preparation) and old carbon (fossil fuel combustion) each contribute about half the total carbon collected on PM filter samples in the Bay Area. Confirming this result and reconciling it with emissions inventory estimates will be important future steps. A chemical mass balance (CMB) study was conducted to estimate the source

committed to following up with more sophisticated techniques for evaluating exposure in Phases II and III.

In the following sections a number of potential policy responses are outlined that adapt existing mitigation strategies and target them using Phase I emissions and demographic data to achieve the goals of the CARE program.

3.2 Grant and Incentive Programs

Through the Carl Moyer Program, the Transportation Fund for Clean Air, the Mobile Source Incentive Fund and other grant programs, the Air District distributes approximately \$40 million per year in incentive funding to reduce emissions from on-road and off-road sources. Data from Phase I of the CARE program will help the Air District focus grants and incentives in areas with high TAC emissions and sensitive populations. Combining gridded emissions of diesel PM and other TAC with population and health effects data is an example of how these data can be used.

The Air District has already focused certain grant programs in this way. Gridded emission information for fine PM has already been incorporated into the policies and procedures for awarding past grant cycles of Carl Moyer Funds. Following this precedent, Air District staff intends to recommend to the Board of Directors that the CARE Program Phase I gridded toxic emissions, population and health effects information be incorporated into the policies and procedures for awarding other Air District grant and incentive funds.

Model year 2007 and later on-road heavy-duty diesel (HDD) vehicles have substantially lower PM emissions than older vehicles. However because of the relatively low turnover rate and high mileage accumulation for HDDs, it will be many years before substantial emission reductions are achieved by fleet turnover alone. Off-road diesel sources, including construction equipment, ships, cargo handling equipment, trains, etc., which are not subject to the same stringent emission standards as on-road HDDs, contribute an increasingly larger fraction of total diesel PM emissions. In addition, the high per vehicle cost (about \$5,000 to \$25,000) of reducing diesel PM emissions from existing sources through retrofits or replacement means that only a small fraction of the existing high emitting diesel PM sources can be cleaned up or replaced each year. Thus, there is a need to use these limited resources as effectively as possible.

3.3 Public Involvement

The Air District conducts public information campaigns to increase public involvement in pollution reduction programs. The Air District works with local Resource Teams in communities including West Oakland, West Contra Costa County, and East Palo Alto to encourage public involvement, and holds numerous meetings throughout the Bay Area on local air quality concerns. For example, the Air District was integrally involved in efforts to enforce the State's new anti-idling rules for diesel trucks that service the Port of Oakland area. Several workshops were held to explain these new regulations to local residents. The Phase I findings will provide critical information to Air District staff and to community members as the Air District continues to work with Bay Area communities.

3.4 Collaboration with Other Government Agencies

The Air District has worked closely with Cal/EPA and others on statewide efforts to reduce air quality impacts from goods movement. The Air District is also collaborating with the Metropolitan Transportation Commission, the Port of Oakland, and other stakeholders to reduce emissions from goods movement in the Bay Area. The Air District is also working closely with ARB and two railroads to implement the statewide Railroad Memorandum of Understanding. The CARE Program Phase I findings will provide critical technical support for these efforts.

The Air District also has an advisory role on air quality issues related to land use development, housing, and transportation. The Air District reviews and comments on local general plans and environmental documents. Air District staff will incorporate Phase I findings into outreach to cities and counties regarding TACs, buffer zones, and incompatible land uses.

Although the State and federal governments regulate mobile sources, the largest sources of diesel PM and other TACs, the Air District works closely with ARB to achieve stringent mobile source regulations. In 2005 the Air District supported ARB regulations on Cargo Handling Equipment at Ports and Railyards and Auxiliary Engines on Ocean-Going Vessels. The Phase I findings will help the Air District and Bay Area communities to advocate for additional regulations from ARB.

3.5 Model Ordinances

The Air District develops model ordinances to reduce criteria and toxic pollutant emissions that are adopted and enforced by local governments. For example, the Air District has developed a model ordinance to limit residential wood burning that many local jurisdictions have adopted. Similarly, the Phase I findings will aid the Air District as we explore other such model ordinances, such as local ordinances to limit idling of diesel equipment.

3.6 Regulations

The Air District has authority to regulate criteria pollutant and toxic emissions from stationary sources and indirect sources. The CARE Program Phase I findings will help identify priorities for TAC reductions in new or modified Air District regulations. Initial emphasis will likely be placed on stationary sources. The Air District also has authority to regulate indirect sources, however, so the Air District may also consider regulatory programs focused on large indirect sources of TAC, for example facilities that attract large numbers of diesel vehicles.

3.7 New Legislation

The Air District sponsors and supports legislation to reduce criteria pollutant and toxic emissions from on-road and off-road mobile sources and other sources. For example, in 2006 the Air District supported SB 1601 (Lowenthal), which would have required Best Available Control Technology to reduce emissions at California ports. In 2005, the Air District supported several bills related to the reduction of TAC, including AB 694 (Chan), which the Air District sponsored to expand the use of Transportation Fund for Clean Air (TFCA) funding to clean up Bay Area

heavy duty diesel vehicles that are not part of public agency fleets*. Phase I findings will help identify and advocate for additional legislation.

4. NEXT STEPS

4.1. Future Work

Future phases of the CARE program will build on work in Phase I to refine the preliminary TAC inventory, apply air quality models to estimate TAC concentrations, and collect supplemental measurements of TAC concentrations (Phase II). Measurement-based and model-based concentrations will be used in combination with exposure models to more realistically estimate actual population exposures (Phase III). Additional TAC mitigation strategies will also be defined. The outlines below begin to summarize future phases of the CARE program. More details will be developed in a CARE protocol document.

4.2. Phase II

In Phase II the Air District will:

- Further develop the TAC emissions inventory, including a reevaluation of diesel PM emissions from construction equipment;
- Conduct preliminary modeling, at both regional and local scales during a summer and a winter season to estimate TAC concentrations;
- Participate with ARB and the Port of Oakland to conduct a *health risk assessment* (HRA) for the port;
- Work with ARB to conduct an HRA for the West Oakland community;
- Carry out measurement studies (already in planning phase) of organic and elemental carbon to estimate diesel PM in cooperation with ARB;
- Refine and implement mitigation strategies identified in Phase I.

4.3. Phase III

Phase III tasks are still preliminary, and may include the following:

- Further develop the TAC emissions inventory;
- Refine regional and local scale modeling;
- Apply tools developed during the Port of Oakland HRA to other communities;
- Conduct exposure analyses, including micro-scale analyses, to estimate actual population exposures;
- Refine and implement mitigation strategies identified in Phases I and II.

* Public agency fleets were already eligible.

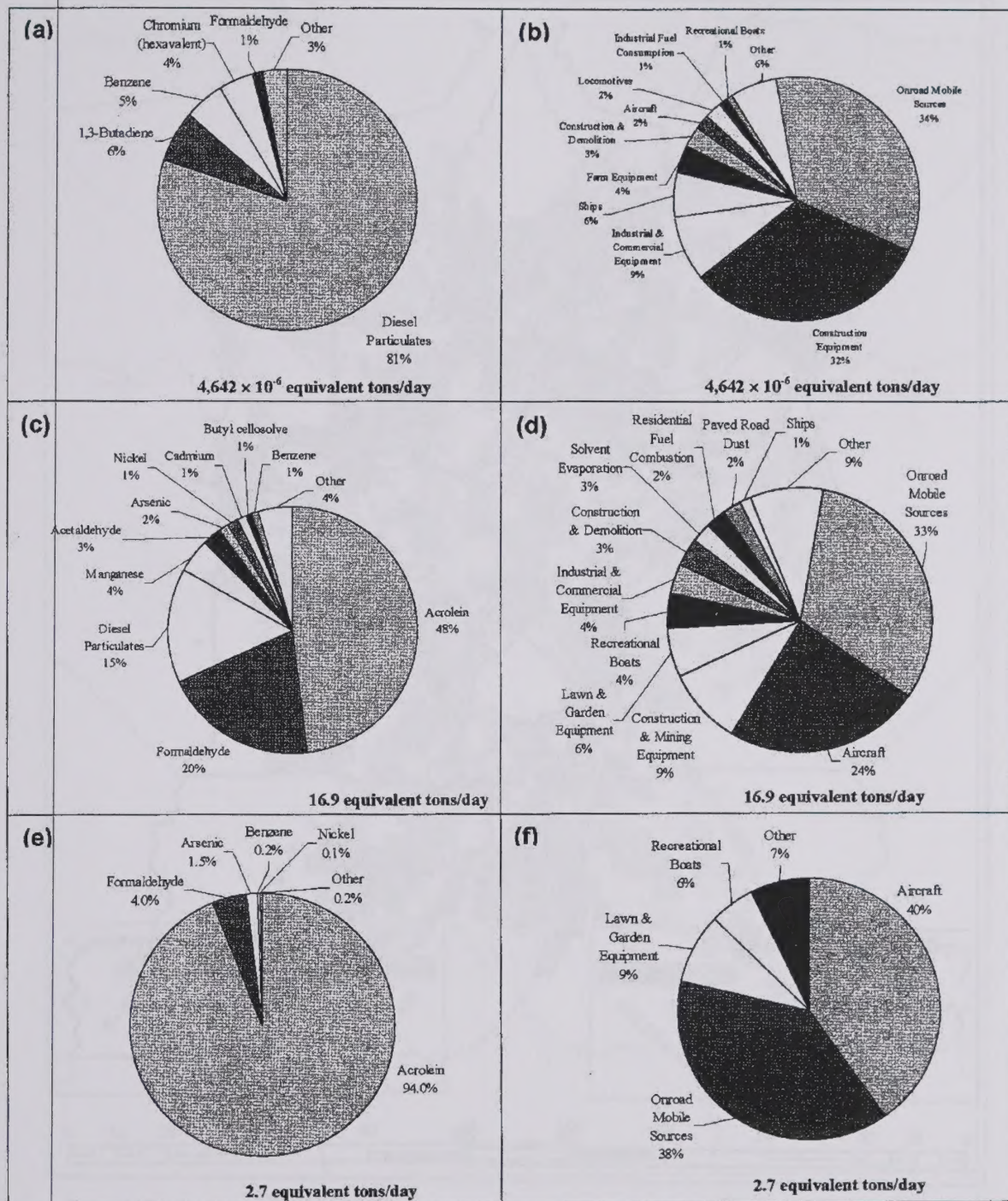


Figure 1. Contributions to Bay Area-wide toxicity-weighted emissions, broken down by TAC and by emissions source category: (a) cancer toxicity-weighted emissions by pollutant; (b) cancer toxicity-weighted emissions by source category; (c) chronic toxicity-weighted emissions by pollutant; (d) chronic toxicity-weighted emissions by source category; (e) acute toxicity-weighted emissions by pollutant; (f) acute toxicity-weighted emissions by source category.

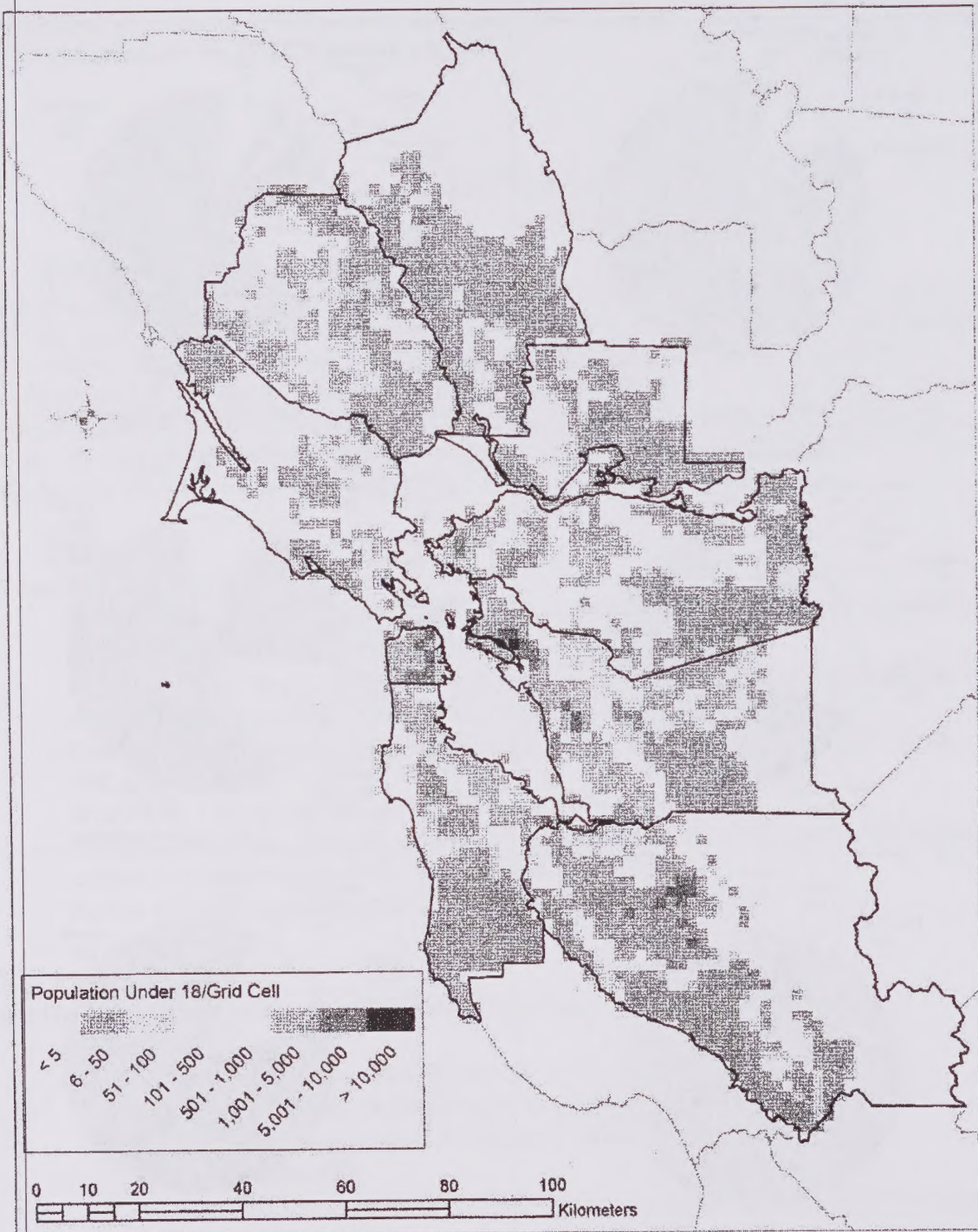


Figure 3a. Distribution of populations under 18 years of age.

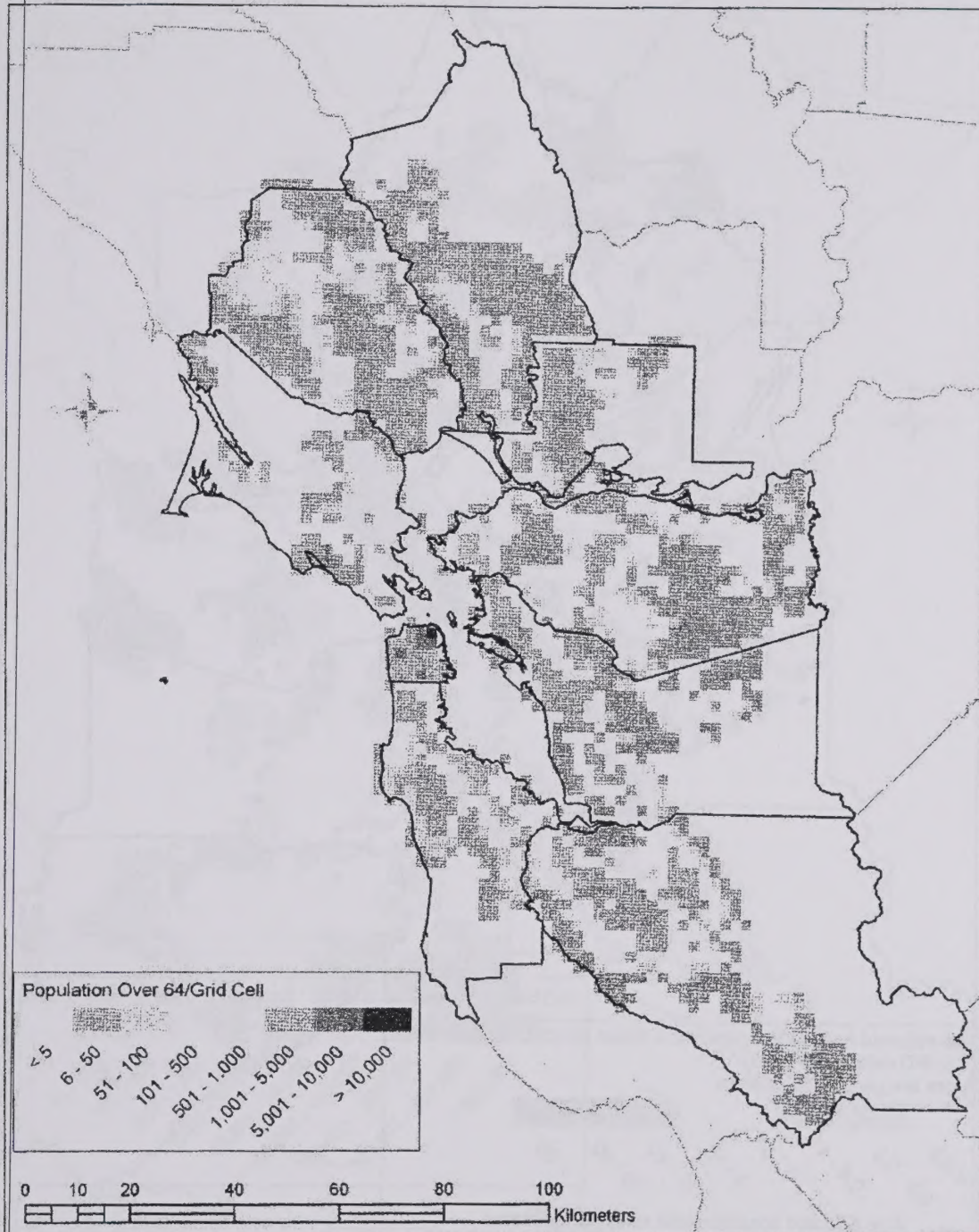


Figure 3b. Distribution of populations over 64 years of age.

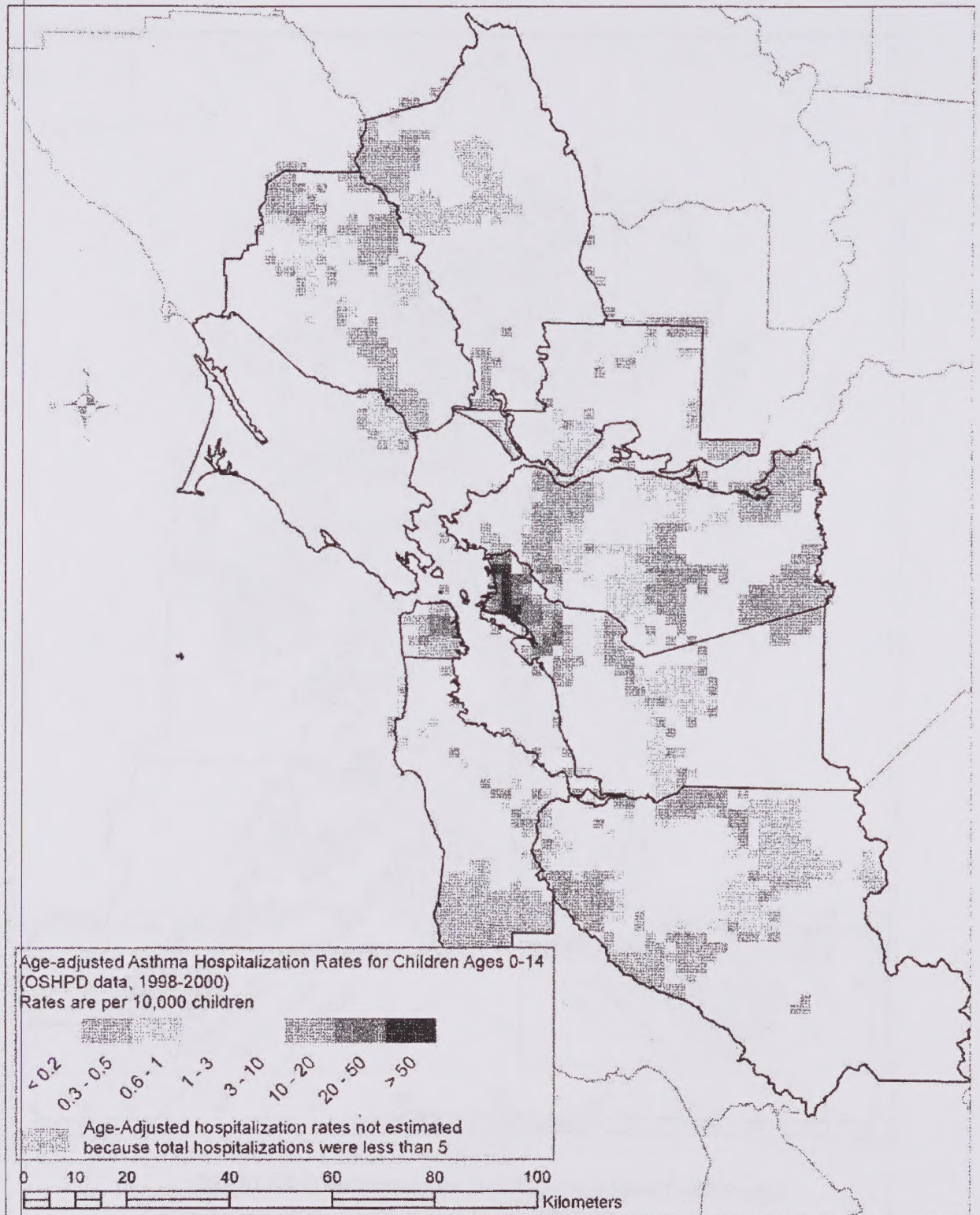


Figure 3d. Age-adjusted rates of hospitalization due to asthma in children 14 years of age and below. Note that white areas represent areas with no available data.

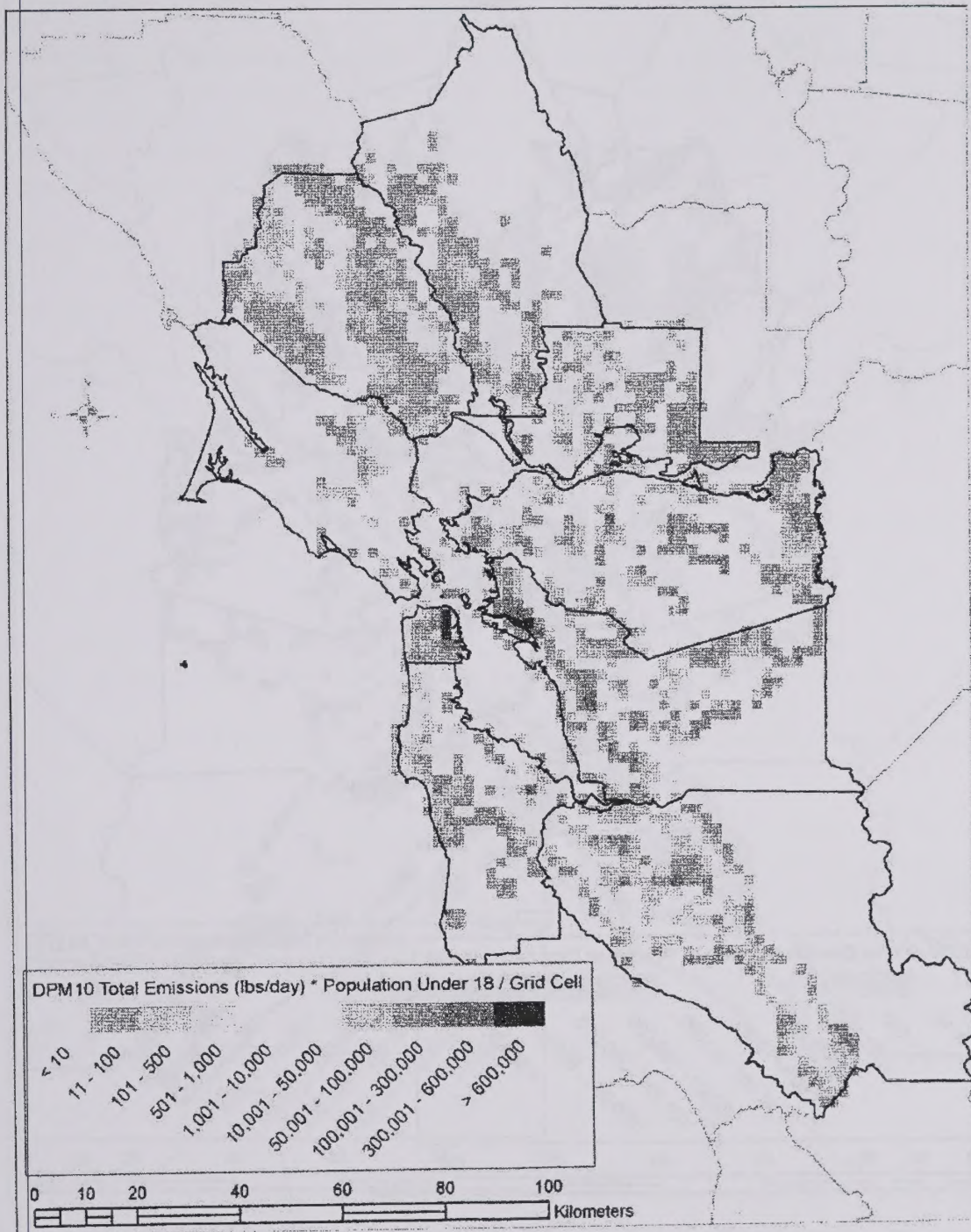


Figure 4a. Diesel particulate matter (PM) emissions weighted by population under 18.

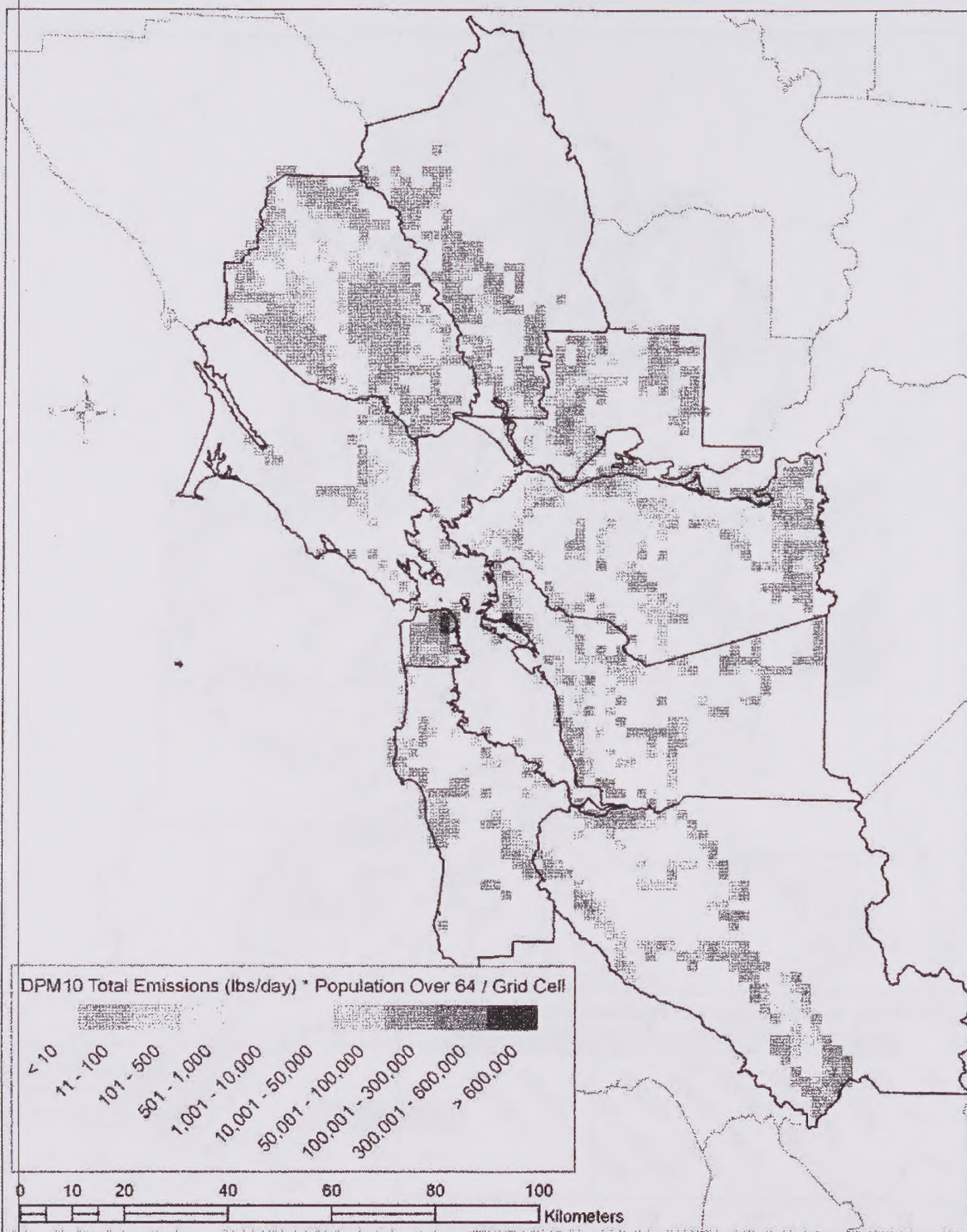


Figure 4b. Diesel PM emissions weighted by population over 64.

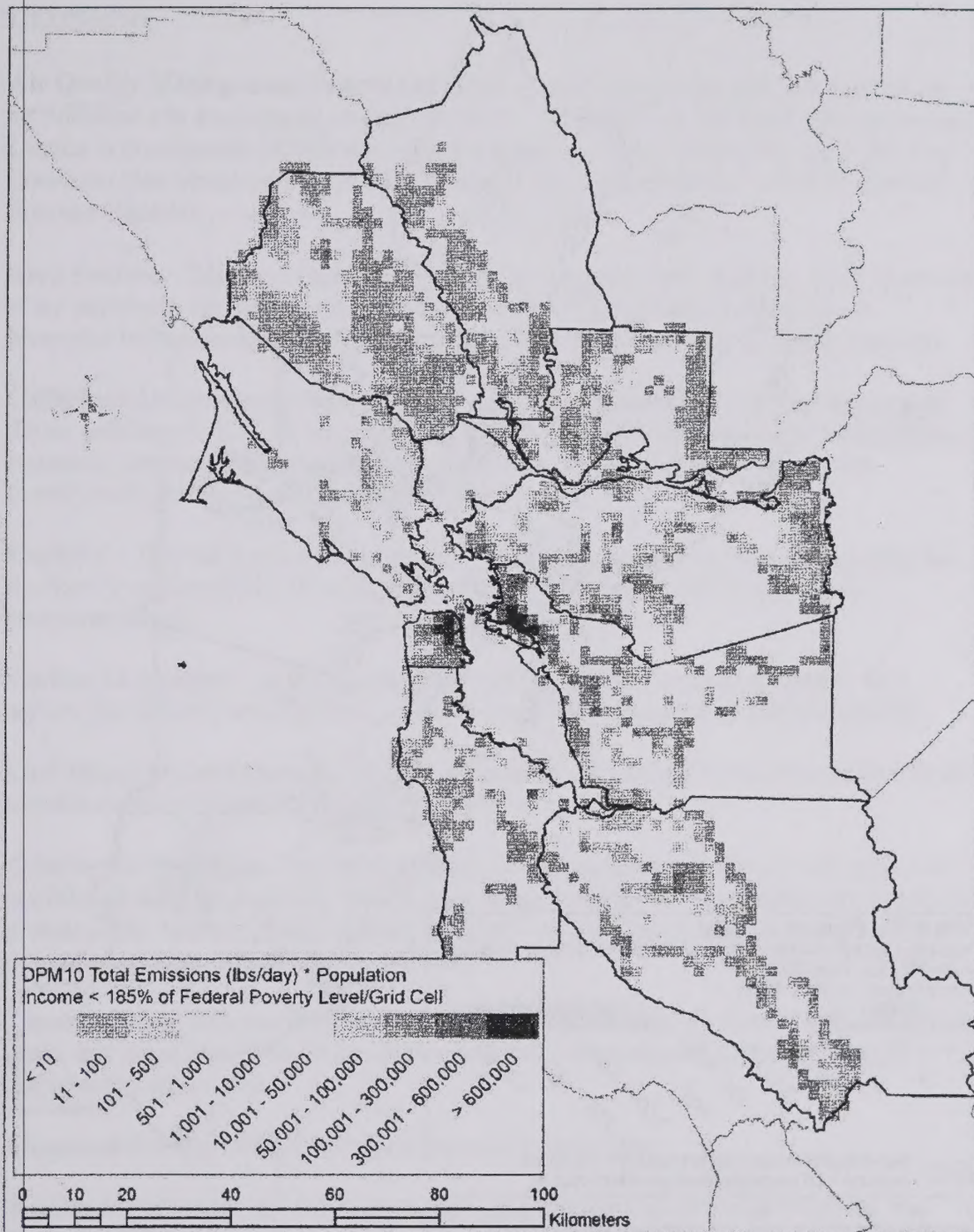


Figure 4c. Diesel PM emissions weighted by population of low-income families (below 185% of the federal poverty level).

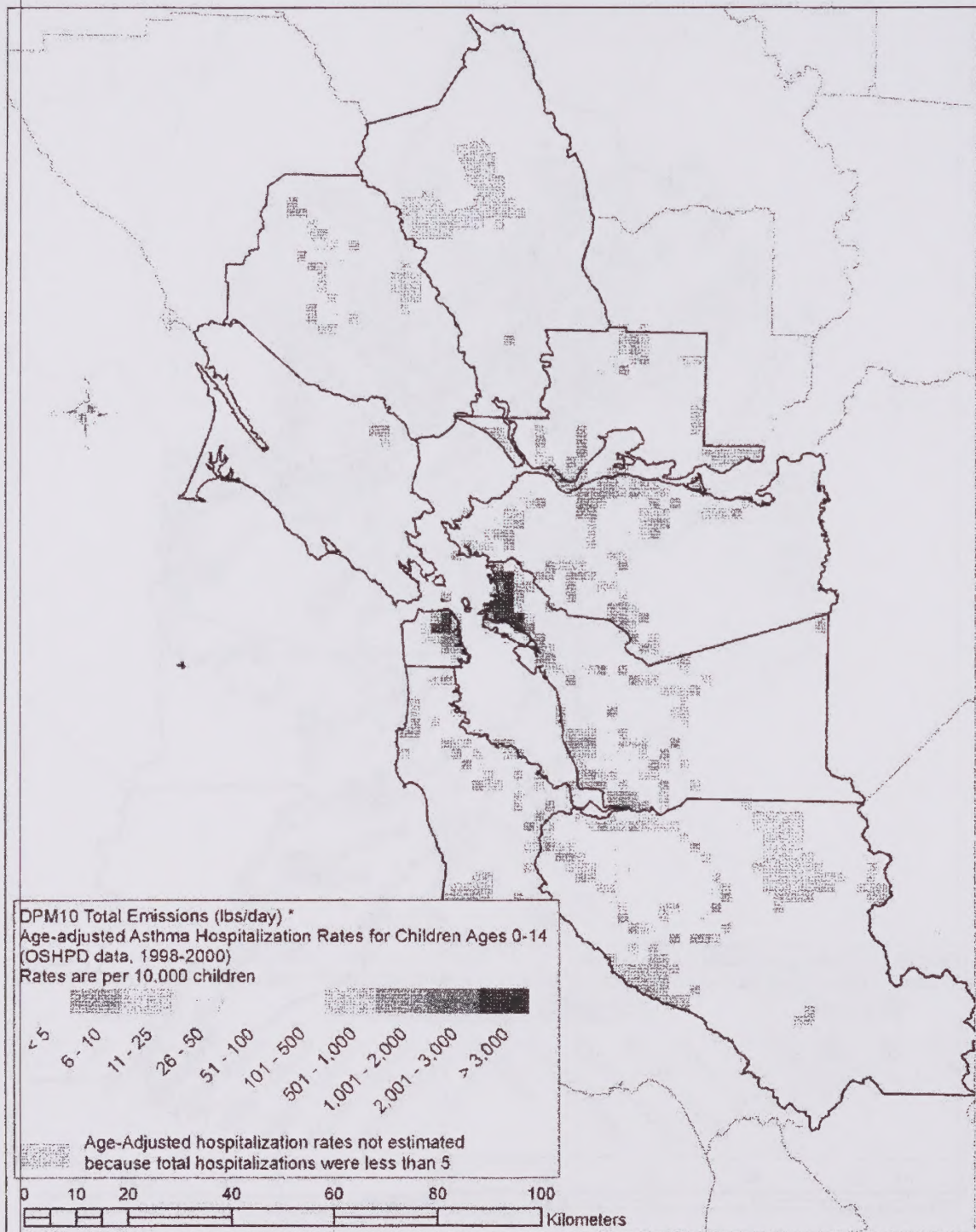


Figure 4d. Diesel PM emissions weighted by age-adjusted asthma rates for children 14 and under.

GLOSSARY

Air Quality Management District (AQMD) – Local agency charged with controlling air pollution and attaining air quality standards. The Bay Area Air Quality Management District is the regional AQMD that includes Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo and Santa Clara Counties and the southern halves of Solano and Sonoma Counties.

Area Sources – Sources of air pollutants that individually emit relatively small quantities of air pollutants, but which cumulatively may emit large quantities of emissions. Examples include water heaters, lawn maintenance equipment and consumer products.

California Air Resources Board (ARB) – The State of California agency responsible for air pollution control. Responsibilities include: establishing State ambient air quality standards, setting allowable emission levels for motor vehicles in California and oversight of local air quality management districts.

Cal/EPA – The California Environmental Protection Agency is an umbrella agency for the State's environmental Boards and Departments, including the California Air Resources Board.

Carbon 14 Analysis – A process for determining the age of carbon materials. Old carbon (fossil fuels) contains less carbon 14 than new carbon (wood and vegetation).

Carl Moyer Grant Program – A grant program funded by the State that provides funds to reduce exhaust emissions from heavy-duty diesel engines.

Criteria Air Pollutants – Air pollutants for which the federal or State government has established ambient air quality standards, or criteria, for outdoor concentration in order to protect public health. Criteria pollutants include: ozone, carbon monoxide, sulfur dioxide, particulate matter, nitrogen oxide, and lead.

Chemical Mass Balance Model – A receptor model that uses profiles of different source types, and using best-fit methods, determines likely source contributions to measured ambient concentrations.

Elemental Carbon (EC) – Elemental carbon is mostly soot.

Emissions Inventory – A list of air pollutants emitted into an area's atmosphere, in amounts (commonly tons) per day or year, by type of source.

Health Risk Assessment – An analysis where human exposure to toxic substances is estimated, and considered together with information regarding the toxic potency of the substances, to provide quantitative estimates of health risk.

Indirect Sources – Land-uses and facilities which attract or generate motor vehicle trips and thus result in air pollutant emissions, e.g., distribution centers, shopping centers, and office buildings.

Metropolitan Transportation Commission – The Metropolitan Transportation Commission is the transportation planning agency for the San Francisco Bay Area.

Mobile Source – Any vehicle that produces air pollution, such as cars, trucks and motorcycles (on road mobile sources) or ships, trains and construction equipment (off-road mobile sources).

Organic Carbon (OC) – A complex mixture of organic compounds, including hydrocarbons, that form particles. Sources of (OC) are combustion sources such as gasoline and diesel engines and wood or biomass burning.

Ozone – A pungent, colorless, toxic gas. A product of complex photochemical processes, usually in the presence of sunlight. Ozone in the lower atmosphere is a criteria air pollutant.

Particulate Matter – A particle of solid or liquid matter; soot, dust, aerosols, fumes and mists.

Point Source – A single stationary source, such as a smoke stack.

Port of Oakland – The port commissions owns and operates seaport facilities, Oakland International Airport, and commercial properties including Jack London Square.

Railroad MOU – A memorandum of understanding among the California Air Resources Board and the Union Pacific Rail Road and the BNSF Railway. It requires emissions reductions and health risk assessments for major rail yards.

Stationary Source – A fixed, non-mobile source of air pollution, usually at industrial or commercial facilities.

Toxic Air Contaminants – Air pollutants which cause illness or death in relatively small quantities. Non-criteria air contaminants that, upon exposure, ingestion, inhalation, or assimilation into organisms either directly from the environment or indirectly by ingestion through food chains, will cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions, or physical deformations in such organisms or their offspring.

Appendix C:

Comprehensive Project List for the Transportation 2035 Plan and Alternatives

Appendix C: Project Listing (sorted by county, then by Reference Number)

Reference Number	Corridor	Investment Type*	Project/Program	Transportation 2035 Plan (Proposed Project)	Alternatives	HM/CPE = Heavy Maintenance/Climate Protection Emphasis		
					No Project	HM/CPE	HM/CPE + Pricing	HM/CPE + Land
Bay Area Region/Multi-County								
21002	Region	Committed	Implement Freeway Service Patrol, Call Box, and Incident Management Programs (includes incident detection equipment and incident management systems)	☒	☒	☒	☒	☒
21005	Region	Committed	Fund and implement TransLink®	☒	☒	☒	☒	☒
21006	Region	Committed	Fund and implement Regional Transportation Marketing program	☒	☒	☒	☒	☒
21008	Region	Committed	Fund and implement 511 Traveler Information	☒	☒	☒	☒	☒
21011	Region	New Commitment	Transportation for Livable Communities (TLC): provide planning and capital funds to improve pedestrian, bicycle and transit access; and support station development areas and FOCUS Priority Development Areas (PDAs)	☒	☐	☒	☒	☒
21012	Golden Gate	Committed	Golden Gate Bridge seismic retrofit (completes Phase 3)	☒	☒	☒	☒	☒
21013	Region	Committed	Rehabilitate state-owned toll bridges in the Bay Area	☒	☒	☒	☒	☒
21015	Region	Committed	Fund Toll Bridge Seismic Retrofit Program	☒	☒	☒	☒	☒
21017	Region	New Commitment	Small transit operators in Alameda, Contra Costa, Napa, Solano and Sonoma counties – transit operating and capital improvement program (including replacement, rehabilitation and minor enhancements for rolling stock, equipment, fixed facilities and other capital assets; does not include system expansion)	☒	☐	☒	☒	☒
21154	Region	New Commitment	Procure buses for AC Transit transbay, express and local services	☒	☐	☐	☐	☐
21320	Golden Gate	Committed	Construct Golden Gate Bridge moveable median barrier	☒	☒	☒	☒	☒

* "Committed" projects are those projects that are fully funded via funds reserved by law for specific uses, or allocated by MTC action prior to the development of the Draft Transportation 2035 Plan.

"New Commitment" projects are those projects funded in part or in full with "discretionary funds" which are flexible funds available to MTC (and not already programmed to "Committed" projects) for assignment via the Transportation 2035 Plan planning process.

Reference Number	Corridor	Investment Type*	Project/Program	Transportation 2035 Plan (Proposed Project)	Alternatives		HM/CPE = Heavy Maintenance/Climate Protection Emphasis		
					No Project		HM/CPE	HM/CPE + Pricing	HM/CPE + Land
Bay Area Region/Multi-County									
21342	San Francisco	Committed	Extend Caltrain to Transbay Terminal and replace Transbay Terminal, including the construction of the new Transbay Transit Center Building and rail foundation (Phase 1)	✓	✓	✓	✓	✓	✓
21619	Peninsula	Committed	Expand Caltrain Express service: design and implement safety elements related to signal communication and positive train control (Phase 2a)	✓	✓	✓	✓	✓	✓
21627	Peninsula	Committed	Electrify Caltrain from Tamien to San Francisco (includes installation of power substations and other infrastructure)	✓	✓	✓	✓	✓	✓
22001	Golden Gate	Committed	Implement Sonoma Marin Area Rail Transit District (SMART) commuter rail project (includes environmental, engineering, right-of-way, vehicle procurement and operations)	✓	✓	✓	✓	✓	✓
22003	Eastshore-North	Committed	Capitol Corridor: Phase 2 enhancements (includes grade separations at High Street, Davis Street and Hesperian Street)	✓	✓	✓	✓	✓	✓
22006	Region	Committed	Improve ferry facilities/equipment including the Downtown Ferry Terminal and procuring additional spare ferry vessels	✓	✓	✓	✓	✓	✓
22008	San Francisco	Committed	Extend Caltrain to Transbay Terminal and replace Transbay Terminal, including preliminary engineering; environmental; planning, specifications, and estimate (PS&E); and right-of-way phases of downtown extension (Phase 2a)	✓	✓	✓	✓	✓	✓
22009	Eastshore-North	Committed	Implement Capitol Corridor intercity rail service (includes increased track capacity, rolling stock and frequency improvements)	✓	✓	✓	✓	✓	✓
22240	Region	Committed	Fund Regional Measure 2 Express Bus South improvements (includes park-and-ride lots, HOV access improvements and rolling stock)	✓	✓	✓	✓	✓	✓
22241	Region	Committed	Fund Regional Measure 2 studies (Water Emergency Transportation Authority environmental studies, I-680/Pleasant Hill BART Connector Study)	✓	✓	✓	✓	✓	✓
22243	Region	Committed	Fund Regional Measure 2 Express Bus North improvements (includes park-and-ride lots and rolling stock)	✓	✓	✓	✓	✓	✓
22244	Region	Committed	Fund City CarShare	✓	✓	✓	✓	✓	✓

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					No Project	HM/CPE	HM/CPE + Pricing	HM/CPE + Land	
Bay Area Region/Multi-County									
22245	Region	Committed	Fund Safe Routes to Transit	☒	☒	☒	☒	☒	☒
22247	Region	New Commitment	Regional Bicycle Program: provide capital funds to fully build out the Regional Bicycle Network as defined in MTC's Regional Bicycle Master Plan	☒	☐	☐	☐	☐	☐
22423	Region	New Commitment	Lifeline Transportation Program: fund programs and services that address transportation gaps specific to low-income communities	☒	☐	☐	☐	☐	☐
22425	Region	New Commitment	Planning funds for the Metropolitan Transportation Commission, Association of Bay Area Governments, Bay Conservation and Development Commission, and nine county congestion management agencies	☒	☐	☒	☒	☒	☒
22481	Region	New Commitment	Caltrain – transit operating and capital improvement program (including replacement, rehabilitation and system enhancements for rolling stock, equipment, fixed facilities and other capital assets); station improvements (e.g., platforms) are included	☒	☐	☒	☒	☒	☒
22520	Region	Committed	Implement BART earthquake safety program	☒	☒	☒	☒	☒	☒
22636	Region	Committed	Implement BART transbay tube earthquake safety improvements (Phase 1)	☒	☒	☒	☒	☒	☒
22676	Region	New Commitment	Improve passenger capacity at 43 BART stations, including platform modifications and faregate, stair, elevator and escalator additions	☒	☐	☐	☐	☐	☐
22765	Tri-Valley	New Commitment	Improve the connection between I-580 and I-680 via HOV direct connectors	☒	☐	☐	☐	☐	☐
22991	Fremont-South Bay	Committed	Widen I-680 southbound in Santa Clara and Alameda counties from Route 237 to Route 84 including a HOT lane, ramp metering, auxiliary lanes and pavement rehabilitations	☒	☒	☒	☒	☒	☒
94089	Golden Gate	New Commitment	Reconstruct south access to the Golden Gate Bridge, from Doyle Drive to Broderick Street (design and construction phases)	☒	☐	☐	☐	☐	☐
94152	North Bay East-West	Committed	Widen Route 12 (Jamieson Canyon) from 2 lanes to 4 lanes from I-80 in Solano County to Route 29 in Napa County (Phase 1)	☒	☒	☒	☒	☒	☒

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Reference Number	Corridor	Investment Type*	Project/Program	Transportation 2035 Plan (Proposed Project)	Alternatives		HM/CPE = Heavy Maintenance/Climate Protection Emphasis		
					No Project		HM/CPE	HM/CPE + Pricing	HM/CPE + Land
Bay Area Region/Multi-County									
94525	Region	New Commitment	BART– transit operating and capital improvement program (including replacement, rehabilitation and minor enhancements, equipment, fixed facilities and other capital assets)	☒	☐	☒	☒	☒	
94526	Region	New Commitment	AC Transit – transit operating and capital improvement program (including replacement, rehabilitation and minor enhancements for rolling stock, equipment, fixed facilities and other capital assets; does not include system expansion)	☒	☐	☒	☒	☒	
94527	Region	New Commitment	Livermore Amador Valley Transit Authority (LAVTA) – transit operating and capital improvement program (including replacement, rehabilitation and minor enhancements for rolling stock, equipment, fixed facilities and other capital assets; does not include system expansion)	☒	☐	☒	☒	☒	
94541	Eastshore-North	Committed	Reconstruct existing Benicia-Martinez Bridge for southbound traffic	☒	☒	☒	☒	☒	
94558	Region	New Commitment	Central Contra Costa Transit Authority (CCCTA) – transit operating and capital improvement program (including replacement, rehabilitation and minor enhancements for rolling stock, equipment, fixed facilities and other capital assets; does not include system expansion)	☒	☐	☒	☒	☒	
94572	Region	New Commitment	Golden Gate Transit – transit operating and capital improvement program (including replacement, rehabilitation and minor enhancements for rolling stock, equipment, fixed facilities and other capital assets; does not include system expansion)	☒	☐	☒	☒	☒	
94610	Region	New Commitment	Valley Transportation Authority (VTA) – transit operating and capital improvement program (including replacement, rehabilitation and minor enhancements for rolling stock, equipment, fixed facilities and other capital assets; does not include system expansion)	☒	☐	☒	☒	☒	
94636	Region	New Commitment	San Francisco Municipal Transportation Agency (Muni) – transit operating and capital improvement program (including replacement, rehabilitation and other minor enhancements for rolling stock, equipment, fixed facilities and other capital assets, does not include system expansion)	☒	☐	☒	☒	☒	

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"New Commitment" projects are those projects funded in part or in full with "discretionary funds" which are flexible funds available to MTC (and not already programmed to "Committed" projects) for assignment via the Transportation 2035 Plan planning process.

Reference Number	Corridor	Investment Type*	Project/Program	Transportation 2035 Plan (Proposed Project)	Alternatives		HM/CPE = Heavy Maintenance/Climate Protection Emphasis		
					No Project		HM/CPE	HM/CPE + Pricing	HM/CPE + Land
Bay Area Region/Multi-County									
94666	Region	New Commitment	SamTrans – transit operating and capital improvement program (including replacement, rehabilitation and minor enhancements for rolling stock, equipment, fixed facilities and other capital assets; does not include system expansion)	☒	☐	☒	☒	☒	☒
94683	Region	New Commitment	Vallejo Transit – transit operating and capital improvement program (including replacement, rehabilitation and minor enhancements for rolling stock, equipment, fixed facilities and other capital assets; does not include system expansion)	☒	☐	☒	☒	☒	☒
98102	Golden Gate	Committed	Reconstruct the South Access to the Golden Gate Bridge: Doyle Drive (environmental study)	☒	☒	☒	☒	☒	☒
230221	Eastshore-North	Committed	Implement I-80 Integrated Corridor Mobility (ICM) project operations and management	☒	☒	☒	☒	☒	☒
230222	Eastshore-North	Committed	Implement San Pablo Avenue SMART Corridors operations and management	☒	☒	☒	☒	☒	☒
230257	Silicon Valley	New Commitment	Convert HOV direct freeway connectors between I-880 and Route 237 to HOT direct freeway connectors	☒	☐	☐	☐	☐	☐
230287	Region	New Commitment	Implement the Bay Area Air Quality Management District's Goods Movement Emission Reductions Project (includes replacement or retrofitting of up to 800 port and general goods movement trucks in the region)	☒	☐	☒	☒	☒	☒
230336	Region	Committed	Implement recommendations from MTC's Transit Connectivity Study	☒	☒	☒	☒	☒	☒
230419	Region	New Commitment	Freeway Performance Initiative (FPI): maximize freeway performance and reliability using primarily technology and limited expansions at essential locations; includes Traffic Operations System (TOS) infrastructure, TOS maintenance and replacement, arterial coordination and management, and performance monitoring	☒	☐	☐	☐	☐	☐
230550	Region	New Commitment	Transportation Climate Action Campaign: implement a five-year campaign to reduce greenhouse gas emissions; includes funding for a comprehensive outreach and education campaign, Safe Routes to School, Safe Routes to Transit, and Transit Priority Measures	☒	☐	☐	☐	☐	☐

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					No Project	HM/CPE	HM/CPE + Pricing	HM/CPE + Land	
Bay Area Region/Multi-County									
230649	Region	Committed	High-Speed Rail: fund supporting infrastructure for ACE, BART, Caltrain, MUNI and VTA	☒	☐	☐	☐	☐	
230654	Delta	New Commitment	Route 4 in Contra Costa County from Route 160 to Port Chicago Highway – convert HOV lanes to HOT lanes	☒	☐	☐	☐	☐	
230656	Eastshore-North	New Commitment	I-80 in Alameda County from Alameda-Contra Costa County line to Bay Bridge — convert HOV lanes to HOT lanes	☒	☐	☐	☐	☐	
230657	Eastshore-North	New Commitment	I-80 in Contra Costa County from Carquinez Bridge to Alameda-Contra Costa County line – convert HOV lanes to HOT lanes	☒	☐	☐	☐	☐	
230658	Eastshore-North	New Commitment	I-80 in Solano County from Route 37 to Carquinez Bridge – widen to add an HOT lane in each direction	☒	☐	☐	☐	☐	
230659	Eastshore-North	New Commitment	I-80 in Solano County from Yolo County line to Route 37 – widen to add an HOT lane in each direction from Yolo County line to Air Base Parkway and from Red Top Road to Route 37	☒	☐	☐	☐	☐	
230660	Eastshore-North	New Commitment	I-80 in Solano County from Red Top Road to Air Base Parkway – convert HOV lanes to HOT lanes	☒	☐	☐	☐	☐	
230661	Santa Clara County-wide	New Commitment	U.S. 101 in Santa Clara County from Cochrane Road to Route 25 – widen to add an HOT lane in each direction	☒	☐	☐	☐	☐	
230662	Santa Clara County-wide	New Commitment	U.S. 101 in Santa Clara County from San Mateo/Santa Clara County line to Cochrane Road – convert HOV lanes to HOT lanes	☒	☐	☐	☐	☐	
230663	Peninsula	New Commitment	U.S. 101 in San Mateo County from San Mateo/Santa Clara County line to Whipple Avenue – convert HOV lanes to HOT lanes	☒	☐	☐	☐	☐	
230664	Peninsula	New Commitment	U.S. 101 in San Mateo County from Whipple Avenue to Millbrae – widen to add an HOT lane in each direction	☒	☐	☐	☐	☐	
230665	Tri-Valley	New Commitment	I-580 westbound in Alameda County from San Joaquin County line to I-680 – widen to add HOT lane and convert HOV lane to HOT lane	☒	☐	☐	☐	☐	
230666	Tri-Valley	New Commitment	I-580 eastbound in Alameda County from San Joaquin County line to Greenville Road – widen to add an HOT lane	☒	☐	☐	☐	☐	

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Bay Area Region/Multi-County									
230667	Tri-Valley	New Commitment	I-580 eastbound in Alameda County from Greenville Road to Tassajara Road – convert HOV lane to HOT lane	☒	☐	☐	☐	☐	☐
230668	Santa Clara County-wide	New Commitment	I-880 in Santa Clara County from Alameda-Santa Clara County line to U.S. 101 – convert HOV lanes to HOT lanes	☒	☐	☐	☐	☐	☐
230669	Eastshore-South	New Commitment	I-880 in Alameda County from Alameda-Santa Clara County line to Marina Boulevard/Lewelling Boulevard – convert HOV lanes to HOT lanes	☒	☐	☐	☐	☐	☐
230670	Eastshore-South	New Commitment	I-880 in Alameda County from Marina Boulevard/Lewelling Boulevard to Hegenberger Road – convert HOV lanes to HOT lanes	☒	☐	☐	☐	☐	☐
230671	Eastshore-South	New Commitment	I-880 northbound in Alameda County from 16th Avenue to Bay Bridge Toll Plaza – convert HOV lane to HOT lane	☒	☐	☐	☐	☐	☐
230672	Transbay San Mateo-	New Commitment	Route 92 westbound in Alameda County from Clawiter Road through San Mateo-Hayward Bridge toll plaza – convert HOV lane to HOT lane	☒	☐	☐	☐	☐	☐
230673	Transbay San Mateo-	New Commitment	Route 84 westbound in Alameda County from I-880 through Dumbarton Bridge toll plaza – convert HOV lane to HOT lane	☒	☐	☐	☐	☐	☐
230674	Santa Clara County-wide	New Commitment	Route 85 in Santa Clara County from U.S. 101 in Mountain View to U.S. 101 in South San Jose – convert HOV lanes to HOT lanes	☒	☐	☐	☐	☐	☐
230675	Santa Clara County-wide	New Commitment	Route 87 in Santa Clara County from Route 85 to U.S. 101 – convert HOV lanes to HOT lanes	☒	☐	☐	☐	☐	☐
230676	Santa Clara County-wide	New Commitment	Route 237 in Santa Clara County from I-880 to Mathilda Avenue – convert HOV lanes to HOT lanes	☒	☐	☐	☐	☐	☐
230677	Santa Clara County-wide	New Commitment	Route 237 in Santa Clara County from Mathilda Avenue to Route 85 – widen to add an HOT lane in each direction	☒	☐	☐	☐	☐	☐
230678	Santa Clara County-wide	New Commitment	I-280 in Santa Clara County from Magdalena Avenue to Leland Avenue – convert HOV lanes to HOT lanes	☒	☐	☐	☐	☐	☐
230679	Santa Clara County-wide	New Commitment	I-280 in Santa Clara County from Leland Avenue to U.S. 101 – widen to add an HOT lane in each direction	☒	☐	☐	☐	☐	☐

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Bay Area Region/Multi-County									
230680	Santa Clara County-wide	New Commitment	I-680 in Santa Clara County from Calaveras Road to U.S. 101 – widen to add an HOT lane in each direction	☒	☐	☐	☐	☐	☐
230681	Sunol Gateway	New Commitment	I-680 northbound in Santa Clara County from Alameda County line to Calaveras Road – widen to add an HOT lane in each direction	☒	☐	☐	☐	☐	☐
230682	Sunol Gateway	New Commitment	I-680 northbound in Alameda County from Santa Clara County line to Route 84 – widen to add an HOT lane in each direction	☒	☐	☐	☐	☐	☐
230683	Sunol Gateway	New Commitment	I-680 in Contra Costa County from Route 84 to Alcosta Road – widen to add an HOT lane in each direction	☒	☐	☐	☐	☐	☐
230684	Tri-Valley	New Commitment	I-680/I-580 direct HOT connector in Alameda County – widen to add HOT lane at connector and eastbound to Tassajara Road	☒	☐	☐	☐	☐	☐
230685	Diablo	New Commitment	I-680 in Contra Costa County from Alcosta Road to Benicia-Martinez Bridge – widen to add an HOT lane in each direction through Walnut Creek and convert HOV lanes to HOT lanes on the remaining segment	☒	☐	☐	☐	☐	☐
230686	Diablo	New Commitment	I-680 in Solano County from Benicia-Martinez Bridge to I-80 – widen to add an HOT lane in each direction	☒	☐	☐	☐	☐	☐
230687	Diablo	New Commitment	I-680/I-80 direct HOT connector in Solano County – widen to add an HOT lane	☒	☐	☐	☐	☐	☐
230688	Golden Gate	New Commitment	U.S. 101 in Marin County from Corte Madera to Route 37 – convert HOV lanes to HOT lanes	☒	☐	☐	☐	☐	☐
230689	Golden Gate	New Commitment	U.S. 101 in Sonoma County from Windsor River Road to Old Redwood Highway – widen to add an HOT lane in each direction and convert HOV lanes to HOT lanes	☒	☐	☐	☐	☐	☐
230690	Delta	New Commitment	I-680/Route 4 direct HOT connector in Contra Costa County – widen to add an HOT lane in each direction	☒	☐	☐	☐	☐	☐
230701	Golden Gate	New Commitment	Widen U.S. 101 (adding an HOV lane in each direction) from Route 37 to Marin/Sonoma County line (Marin County portion) and from Marin/Sonoma County line to Old Redwood Highway in Petaluma	☒	☐	☐	☐	☐	☐

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Appendix C: Project Listing

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Reference Number	Corridor	Investment Type*	Project/Program	Transportation 2035 Plan (Proposed Project)	Alternatives		HM/CPE = Heavy Maintenance/Climate Protection Emphasis		
					No Project	HM/CPE	HM/CPE + Pricing	HM/CPE + Land	
Alameda									
21093	Eastshore-South	Committed	Upgrade Route 92/Clawiter Road interchange, add ramps and overcrossing for Whitesell Street extension, and signalize ramp intersections	☒	☒	☒	☒	☒	☒
21100	Tri-Valley	New Commitment	Construct auxiliary lanes on I-580 between Vasco Road and First Street and modify I-580/Vasco Road interchange	☒	☐	☐	☐	☐	☐
21101	Eastshore-South	Committed	Reconstruct Stargell Avenue from Webster Street to 5th Avenue	☒	☒	☒	☒	☒	☒
21103	Eastshore-South	New Commitment	Construct grade separation structure on Central Avenue at Union Pacific Railroad crossing	☒	☐	☐	☐	☐	☐
21105	Tri-Valley	Committed	Construct interchange at the extension of Isabel Avenue (Route 84) to I-580	☒	☒	☒	☒	☒	☒
21112	Sunol Gateway	New Commitment	Improve Crow Canyon Road by widening shoulders, realigning curves and constructing retaining walls	☒	☐	☒	☒	☒	☒
21114	Fremont-South Bay	Committed	Construct grade separations on Washington Boulevard/Paseo Padre Parkway at the Union Pacific railroad tracks and proposed BART extension	☒	☒	☒	☒	☒	☒
21116	Tri-Valley	Committed	Widen I-580 from Tassajara Road to Greenville Road for HOV and auxiliary lanes	☒	☒	☒	☒	☒	☒
21123	Fremont-South Bay	New Commitment	Expand Union City BART station to create intermodal rail station	☒	☐	☐	☐	☐	☐
21125	Fremont-South Bay	Committed	Extend HOV lane westbound on Route 84 between Newark Avenue undercrossing and west of the I-880 interchange	☒	☒	☒	☒	☒	☒
21126	Fremont-South Bay	Committed	Construct westbound Route 84 HOV on-ramp at Newark Boulevard	☒	☒	☒	☒	☒	☒
21131	Eastshore-South	Committed	Build a BART Oakland Airport Connector between Coliseum BART station and Oakland International Airport	☒	☒	☒	☒	☒	☒
21132	Fremont-South Bay	Committed	Extend BART from Fremont to Warm Springs	☒	☒	☒	☒	☒	☒
21133	Tri-Valley	Committed	Construct new West Dublin/Pleasanton BART station along the I-580 median	☒	☒	☒	☒	☒	☒

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					No Project		HM/CPE	HM/CPE + Pricing	HM/CPE + Land
Alameda									
21139	Tri-Valley	New Commitment	Improve Vasco Road with safety features including realignment, widening and installation of median barriers	☒	☐	☒	☒	☒	☒
21144	Eastshore-North	New Commitment	Reconstruct I-80/Gilman Avenue interchange into a roundabout	☒	☐	☐	☐	☐	☐
21159	Alameda County-wide	New Commitment	Expand/enhance AC Transit facilities in northern Alameda County, including new operating facility	☒	☐	☐	☐	☐	☐
21451	Eastshore-South	New Commitment	Construct additional turn- and bus-loading lanes on Hesperian Boulevard and East 14th Street	☒	☐	☐	☐	☐	☐
21455	Tri-Valley	Committed	Widen I-238 to 6 lanes between I-580 and I-880, including auxiliary lanes on I-880 between I-238 and A Street	☒	☒	☒	☒	☒	☒
21456	Tri-Valley	Committed	Construct auxiliary lanes on I-580 between Santa Rita Road/Tassajara Road and Airway Boulevard	☒	☒	☒	☒	☒	☒
21460	Tri-Valley	Committed	Construct bicycle/pedestrian roadway in existing Alameda County and Southern Pacific right-of-way between the Dublin/Pleasanton BART station and Dougherty Road; construct bus lane on Dougherty Road	☒	☒	☒	☒	☒	☒
21464	Alameda County-wide	Committed	Provide paratransit service for AC Transit, BART and non-mandated city programs to coordinate and close paratransit service gaps	☒	☒	☒	☒	☒	☒
21465	Alameda County-wide	Committed	Enhance transit throughout the county using transit center development funds	☒	☒	☒	☒	☒	☒
21466	Eastshore-South	Committed	Improve Washington Avenue/Beatrice Street interchange at I-880 through reconstruction and widening of on/off ramps	☒	☒	☒	☒	☒	☒
21472	Sunol Gateway	Committed	Improve I-680/Bernal Avenue interchange	☒	☒	☒	☒	☒	☒
21473	Tri-Valley	Committed	Construct a 4-lane arterial connecting Dublin Boulevard and North Canyons Parkway in Livermore	☒	☒	☒	☒	☒	☒
21475	Tri-Valley	New Commitment	Improve I-580/First Street interchange in Livermore	☒	☐	☐	☐	☐	☐

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Alameda									
21477	Tri-Valley	New Commitment	Reconstruct I-580/Greenville Road interchange in Livermore	☒	☐	☐	☐	☐	
21482	Fremont-South Bay	Committed	Extend Fremont Boulevard to connect with Dixon Landing Road in Milpitas	☒	☒	☒	☒	☒	
21484	Fremont-South Bay	Committed	Widen Kato Road from Warren Avenue to Milmont Drive and include bicycle lanes	☒	☒	☒	☒	☒	
21489	Tri-Valley	Committed	Improve I-580/San Ramon Road/Foothill Road interchange	☒	☒	☒	☒	☒	
21618	Transbay San Mateo-	Committed	Implement commuter rail service on the Dumbarton Bridge (environmental, design and right-of-way phases)	☒	☐	☐	☐	☐	
21992	Alameda County-wide	New Commitment	Implement AC Transit transit priority measures (TPM) and corridor improvements (Element 1)	☒	☐	☐	☐	☐	
22002	Transbay Bay Bridge	Committed	Extend I-880 northbound HOV lane from Maritime Street to the Bay Bridge toll plaza	☒	☒	☒	☒	☒	
22007	Alameda County-wide	Committed	Implement bicycle and pedestrian projects/programs in Alameda County	☒	☒	☒	☒	☒	
22013	Tri-Valley	Committed	Construct I-580 eastbound truck climbing lane at the Altamont Summit	☒	☒	☒	☒	☒	
22021	Eastshore-South	New Commitment	Expand AC Transit transfer centers and park-and-ride facilities in central Alameda County	☒	☐	☐	☐	☐	
22056	Alameda County-wide	Committed	Improve Ashby BART station to support Ed Roberts Campus and future transit-oriented development	☒	☒	☒	☒	☒	
22062	Fremont-South Bay	Committed	Construct infrastructure to support future Irvington BART station	☒	☒	☒	☒	☒	
22063	Eastshore-South	Committed	Improve Route 238 corridor near Foothill Boulevard/I-580 by removing parking during peak periods and spot widening	☒	☒	☒	☒	☒	
22082	Eastshore-South	Committed	Improve 7th Street/Union Pacific Railroad entry at Port of Oakland intermodal yards to include grade separation	☒	☒	☒	☒	☒	

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					No Project	HM/CPE	HM/CPE + Pricing	HM/CPE + Land	
Alameda									
22084	Eastshore-South	New Commitment	Improve access to Oakland International Airport's North Field, connecting Route 61 (Doolittle Drive) with Earhart Road and extending infield area at North Field	☒	☐	☐	☐	☐	
22087	Eastshore-South	Committed	Reconstruct I-880/Oak Street on-ramp	☒	☒	☒	☒	☒	☒
22089	Eastshore-North	New Commitment	Improve Martinez Subdivision to include two additional mainline tracks, including crossovers and signaling	☒	☐	☒	☒	☒	☒
22100	Eastshore-South	Committed	Replace overcrossing structure at I-880/Davis Street interchange and add additional travel lanes on Davis Street (includes ramp, intersection and signal improvements)	☒	☒	☒	☒	☒	☒
22106	Eastshore-South	Committed	Construct street extensions in Hayward near Clawiter and Whitesell streets	☒	☒	☒	☒	☒	☒
22455	Eastshore-North	Committed	Implement Bus Rapid Transit service on the Telegraph Avenue/International Boulevard/E. 14th Street corridor	☒	☒	☒	☒	☒	☒
22509	Transbay Bay Bridge	Committed	Provide ferry service between Alameda/Oakland and San Francisco and between Harbor Bay and San Francisco	☒	☒	☒	☒	☒	☒
22511	Transbay Bay Bridge	Committed	Provide ferry service between Berkeley/Albany and San Francisco	☒	☒	☒	☒	☒	☒
22670	Eastshore-South	Committed	Construct HOV lane for southbound I-880 from Hegenberger Road to Marina Boulevard (includes reconstructing bridges at Davis Street and Marina Boulevard)	☒	☒	☒	☒	☒	☒
22760	Eastshore-South	Committed	Relocate the Outer Harbor Intermodal Terminal (OHIT) to the former Oakland Army Base (includes rail yard, storage tracks, lead tracks, truck gates and administrative/operations and maintenance buildings)	☒	☒	☒	☒	☒	☒
22766	Eastshore-South	New Commitment	Assess Fruitvale Avenue rail bridge for seismic retrofit	☒	☐	☐	☐	☐	☐
22768	Eastshore-South	New Commitment	Retrofit and repair three Oakland-Alameda Estuary bridges for seismic safety	☒	☐	☒	☒	☒	☒

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					No Project		HM/CPE	HM/CPE + Pricing	HM/CPE + Land
Alameda									
22769	Eastshore-South	Committed	Improve northbound I-880 ramp geometries at 23rd and 29th avenues (includes modifications to local streets, landscaping and soundwall construction)	☒	☒	☒	☒	☒	☒
22770	Eastshore-North	Committed	Install traffic signal on Grand Avenue at Rose Avenue/Arroyo Avenue in Piedmont	☒	☒	☒	☒	☒	☒
22776	Tri-Valley	New Commitment	Widen Route 84 from 2 to 4 lanes from north of Pigeon Pass to Stanley Boulevard and from 2 to 6 lanes from Stanley Boulevard to Jack London Boulevard	☒	☐	☐	☐	☐	☐
22777	Tri-Valley	Committed	Reconstruct on/off-ramps on I-580 in Castro Valley	☒	☒	☒	☒	☒	☒
22779	Fremont-South Bay	Committed	Reconstruct Route 262/I-880 interchange and widen I-880, including grade separation at Warren Avenue and the Union Pacific Railroad (Phase 2)	☒	☒	☒	☒	☒	☒
22780	Eastshore-North	Committed	Implement Bus Rapid Transit on the Grand-MacArthur corridor	☒	☒	☒	☒	☒	☒
22783	Eastshore-South	New Commitment	Assess Fruitvale Avenue roadway bridge for seismic retrofit	☒	☐	☒	☒	☒	☒
94012	Fremont-South Bay	Committed	Implement the Union City BART station transit-oriented development project, including construction of pedestrian grade separations under the BART and Union Pacific Railroad tracks and reconfiguring existing station to provide multimodal loop road (Phase 1)	☒	☒	☒	☒	☒	☒
94030	Fremont-South Bay	Committed	Reconstruct I-880/Route 262 interchange and widen I-880 from 8 lanes to 10 lanes (8 mixed-flow and 2 HOV lanes) from Route 262 (Mission Boulevard) to the Santa Clara County line (Phase 1)	☒	☒	☒	☒	☒	☒
94506	Fremont-South Bay	New Commitment	Construct an improved east-west connection between I-880 and Route 238 (Mission Boulevard) from North Fremont to Union City	☒	☐	☐	☐	☐	☐
94514	Transbay San Mateo-	Committed	Reconstruct I-880/Route 92 interchange with direct connectors	☒	☒	☒	☒	☒	☒
98139	Sunol Gateway	Committed	Acquire right-of-way for ACE rail service between Stockton and Niles Junction, complete track improvements between San Joaquin County and Alameda County, and expand Alameda County station platforms	☒	☒	☒	☒	☒	☒

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					No Project	HM/CPE	HM/CPE + Pricing	HM/CPE + Land	
Alameda									
98207	Eastshore-South	New Commitment	Improve I-880/Broadway-Jackson interchange in Oakland (includes new on- and off-ramps and new signals)	☒	☐	☐	☐	☐	☐
98208	Alameda County-wide	New Commitment	Construct soundwalls in various locations in Alameda County	☒	☐	☐	☐	☐	☐
230047	Eastshore-South	New Commitment	Reconstruct I-880/West A Street interchange in Hayward (includes new sidewalks)	☒	☐	☐	☐	☐	☐
230052	Eastshore-South	Committed	Construct auxiliary lanes on I-880 near Winton in Hayward	☒	☒	☒	☒	☒	☒
230053	Eastshore-South	New Commitment	Reconstruct I-880 Industrial Parkway interchange (Phase 1)	☒	☐	☐	☐	☐	☐
230054	Eastshore-South	Committed	Construct auxiliary lanes on I-880 at Industrial Parkway	☒	☒	☒	☒	☒	☒
230057	Eastshore-South	Committed	Reconstruct I-880/Industrial Parkway interchange, including construction of new northbound I-880 on-ramp and modifications to southbound on-ramp to include an HOV lane (Phase 2)	☒	☒	☒	☒	☒	☒
230066	Eastshore-South	Committed	Improve I-880/Marina Boulevard interchange (includes on- and off-ramp improvements, overcrossing modification, and street improvements)	☒	☒	☒	☒	☒	☒
230083	Alameda County-wide	Committed	Tri-Valley Transit Access: acquire right-of-way along I-580 from Hacienda Drive to the Vasco Road interchange to accommodate rail transit	☒	☒	☒	☒	☒	☒
230086	Tri-Valley	New Commitment	Reconstruct I-580/Fallon Road interchange and I-580/Hacienda Drive interchange in Dublin	☒	☐	☐	☐	☐	☐
230088	Eastshore-South	Committed	Extend existing northbound I-880 HOV lane from north of Hacienda Avenue to Hegenberger Road	☒	☒	☒	☒	☒	☒
230091	Eastshore-South	Committed	Install traffic monitoring systems, signal priority and coordination, ramp metering, and HOV bypass lanes in the I-880, I-238 and I-580 corridors	☒	☒	☒	☒	☒	☒
230094	Eastshore-North	Committed	Construct soundwalls in central Alameda County	☒	☒	☒	☒	☒	☒
230099	Alameda County-wide	New Commitment	Construct northbound I-680 to westbound I-580 connector	☒	☐	☐	☐	☐	☐

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Alameda									
230108	Eastshore-North	New Commitment	Widen I-80 eastbound Powell Street off-ramp in Emeryville	☒	☐	☐	☐	☐	☐
230110	Fremont-South Bay	New Commitment	Construct a grade separation at Route 262/Warm Springs Drive/Mission Boulevard	☒	☐	☐	☐	☐	☐
230114	Fremont-South Bay	New Commitment	Widen Auto Mall Parkway from 4 to 6 lanes between I-680 and I-880, including intersection improvements	☒	☐	☐	☐	☐	☐
230116	Alameda County-wide	New Commitment	Improve rail crossings in Berkeley, including grade separation at Gilman Street, road closures and at-grade crossing improvements (Phase 1)	☒	☐	☐	☐	☐	☐
230120	Eastshore-South	New Commitment	Construct truck parking facilities in northern Alameda County (Phase 1)	☒	☐	☐	☐	☐	☐
230122	Alameda County-wide	New Commitment	Implement a Value-Pricing Parking and Transportation Demand Management program in Berkeley	☒	☐	☐	☐	☐	☐
230125	Alameda County-wide	New Commitment	Improve Ashby/I-80 interchange/Aquatic Park access, including streetscaping, bicycle/pedestrian improvements and minor interchange improvements	☒	☐	☐	☐	☐	☐
230132	Tri-Valley	New Commitment	Improve I-580/Isabel Avenue interchange, including streetscaping and bicycle/pedestrian improvements	☒	☐	☐	☐	☐	☐
230156	Tri-Valley	Committed	Extend West Jack London Boulevard from west of Isabel/Route 84 to El Charro Road	☒	☒	☒	☒	☒	☒
230157	Tri-Valley	Committed	Construct a two-lane gap closure on Las Positas Road from Arroyo Vista to west of Vasco Road	☒	☒	☒	☒	☒	☒
230160	Tri-Valley	Committed	Tri-Valley Transit Access: implement enhanced rapid bus service in Livermore and Dublin (includes higher frequencies, new stops and improved stop amenities)	☒	☒	☒	☒	☒	☒
230169	Eastshore-South	New Commitment	Provide Intelligent Transportation System (ITS) elements for arterial management in Oakland (includes new controllers, signal coordination, transit priority, automatic vehicle locators, speed and level of service monitoring through radar detection, and real time arrival information)	☒	☐	☐	☐	☐	☐
230170	Eastshore-South	New Commitment	Improve access to I-880 from 42nd Avenue and High Street	☒	☐	☐	☐	☐	☐

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Alameda									
230171	Eastshore-South	New Commitment	Improve Route 24/Caldecott Tunnel including bicycle and transit access and soundwall improvements	☒	☐	☐	☐	☐	
230198	Eastshore-South	New Commitment	Upgrade traffic signal systems with Intelligent Transportation System (ITS) elements (includes new controllers, improved system communication, facilities upgrades and relocations, emergency vehicle pre-emption, and improved speed and level of service monitoring)	☒	☐	☐	☐	☐	
230244	Alameda County-wide	New Commitment	Prepare supplemental project study report for Route 84 widening from Pigeon Pass to I-680	☒	☐	☐	☐	☐	
230396	Alameda County-wide	New Commitment	Implement recommendations from the Community-Based Transportation Plan to improve the mobility of low-income residents	☒	☐	☐	☐	☐	
230412	Alameda County-wide	New Commitment	Additional AC Transit and BART transit capital replacement	☒	☐	☐	☐	☐	
230608	Tri-Valley	New Commitment	Construct a westbound auxiliary lane on I-580 between First Avenue and Isabel Avenue in the Tri-Valley area	☒	☐	☐	☐	☐	
230630	Tri-Valley	Committed	Tri-Valley Transit Access: construct westbound off-ramp to connect I-580 to Dublin/Pleasanton BART station (or equivalent)	☒	☒	☒	☒	☒	
230692	Alameda County-wide	New Commitment	Local streets and roads maintenance	☒	☐	☒	☒	☒	

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Contra Costa									
21205	Diablo	New Commitment	Improve the I-680/Route 4 interchange with direct connectors and widen Route 4 from 2 lanes to 3 lanes in each direction between Route 242 and Morello Avenue	☒	☐	☐	☐	☐	☐
21206	Diablo	Committed	Construct a fourth bore at the Caldecott Tunnel complex north of the three existing bores	☒	☒	☒	☒	☒	☒
21207	Diablo	Committed	Construct Martinez Intermodal Station, including site acquisition, demolition and construction of 200 interim parking spaces (Phase 3 initial segment)	☒	☒	☒	☒	☒	☒
21208	Eastshore-North	Committed	Construct Richmond Parkway Transit Center, including signal timing and reconfiguration, parking facility and security improvements	☒	☒	☒	☒	☒	☒
21209	Eastshore-North	Committed	Relocate and expand Hercules Transit Center, including relocation of park-and-ride facility and construction of express bus facilities	☒	☒	☒	☒	☒	☒
21210	Eastshore-North	Committed	Construct Capitol Corridor train station in Hercules	☒	☒	☒	☒	☒	☒
21211	Delta	Committed	Extend BART/East Contra Costa Rail (eBART) eastward from the Pittsburg/Bay Point BART station into eastern Contra Costa County	☒	☒	☒	☒	☒	☒
21214	Delta	Committed	Widen Wilbur Avenue over Burlington Northern Santa Fe Railroad from 2 lanes to 4 lanes	☒	☒	☒	☒	☒	☒
21225	Contra Costa County-wide	Committed	Improve regional and local pedestrian and bicycle system, including construction overcrossings, and expanding sidewalks and facilities	☒	☒	☒	☒	☒	☒
22122	Transbay Bay Bridge	Committed	Implement Richmond Ferry service from Richmond to San Francisco	☒	☒	☒	☒	☒	☒
22352	Diablo	New Commitment	Improve I-680/Norris Canyon Road, including reconstruction of overcrossing, widening of median, construction of new HOV ramps and modifications to the local street network in San Ramon	☒	☐	☐	☐	☐	☐
22353	Diablo	Committed	Construct HOV lane on I-680 southbound between North Main Street and Livorna Road	☒	☒	☒	☒	☒	☒
22354	Diablo	New Commitment	Relocate the western half of the Marina Vista interchange off southbound I-680	☒	☐	☐	☐	☐	☐

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Contra Costa									
22355	Eastshore-North	New Commitment	Modify I-80/Central Avenue interchange	☒	☐	☐	☐	☐	☐
22360	Eastshore-North	New Commitment	Reconstruct I-80/San Pablo Dam Road interchange and modify adjacent interchanges	☒	☐	☐	☐	☐	☐
22365	Diablo	Committed	Improve Martinez Ferry landside facilities	☒	☒	☒	☒	☒	☒
22388	Diablo	New Commitment	Construct Route 242 on-ramp and off-ramp at Clayton Road	☒	☐	☐	☐	☐	☐
22390	Delta	New Commitment	Reconstruct Route 4/Willow Pass Road ramps in Concord to support new infill development at the Concord Naval Weapons Station	☒	☐	☐	☐	☐	☐
22402	Diablo	Committed	Implement the San Ramon School Bus Program, and continue the Lamorinda School Bus Program	☒	☒	☒	☒	☒	☒
22600	Delta	Committed	Widen Somersville Road Bridge in Antioch from 2 lanes to 4 lanes	☒	☒	☒	☒	☒	☒
22602	Diablo	New Commitment	Construct I-680 auxiliary lanes in both directions from Sycamore Valley Road to Crow Canyon Road	☒	☐	☐	☐	☐	☐
22603	Eastshore-North	Committed	Construct 6-level, roughly 785-space parking garage at Richmond Intermodal Transfer Station	☒	☒	☒	☒	☒	☒
22607	Delta	Committed	Widen and extend major streets, and improve interchanges in east Contra Costa County	☒	☒	☒	☒	☒	☒
22609	Diablo	Committed	Widen and extend major streets, and improve interchanges in central Contra Costa County	☒	☒	☒	☒	☒	☒
22610	Eastshore-North	Committed	Widen and extend major streets, and improve interchanges in west Contra Costa County	☒	☒	☒	☒	☒	☒
22611	Eastshore-North	Committed	Implement a low-income student bus pass program in West Contra Costa County	☒	☒	☒	☒	☒	☒

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Contra Costa									
22613	Eastshore-North	Committed	Widen and extend major streets, and improve interchanges in southwest Contra Costa County (includes widening Camino Tassajara to 4 lanes between Danville and Windemere Parkway, and to 6 lanes from Windemere Parkway to Alameda County line)	☒	☒	☒	☒	☒	
22614	Diablo	New Commitment	Construct Martinez Intermodal Station, including an additional 425 parking spaces and vehicle and pedestrian bridges (Phase 3)	☒	☐	☐	☐	☐	
22637	Diablo	Committed	Construct BART crossover at Pleasant Hill BART station	☒	☒	☒	☒	☒	
94045	Eastshore-North	Committed	Purchase new express buses for I-80 express service to be provided by AC Transit, Vallejo Transit and WestCAT (capital costs)	☒	☒	☒	☒	☒	
94046	Delta	Committed	Improve interchanges and parallel arterials to Route 4	☒	☒	☒	☒	☒	
94048	Eastshore-North	Committed	Improve interchanges and parallel arterials to I-80	☒	☒	☒	☒	☒	
94532	Diablo	Committed	Implement the Gateway Lamorinda Traffic Program (includes carpool lot in Lafayette, structural and safety improvements on Moraga Road, intersection realignments, turn lanes, pedestrian accommodation and signal coordination)	☒	☒	☒	☒	☒	
94538	Delta	Committed	Implement the Route 4 transportation management system	☒	☒	☒	☒	☒	
98115	Delta	Committed	Widen Ygnacio Valley/Kirker Pass roads from 4 lanes to 6 lanes from Michigan Boulevard to Cowell Road	☒	☒	☒	☒	☒	
98126	Diablo	Committed	Improve interchanges and arterials parallel to I-680 and Route 24	☒	☒	☒	☒	☒	
98132	Diablo	Committed	Widen and extend Bollinger Canyon Road to 6 lanes from Alcosta Boulevard to Dougherty Road	☒	☒	☒	☒	☒	
98133	Diablo	New Commitment	Widen Pacheco Boulevard from 2 to 4 lanes from Blum Road to Arthur Road	☒	☐	☐	☐	☐	
98134	Diablo	Committed	Widen Dougherty Road to 6 lanes from Red Willow to Contra Costa County line	☒	☒	☒	☒	☒	

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Contra Costa									
98142	Delta	Committed	Widen Route 4 from 4 lanes to 8 lanes, with HOV lanes, from Loveridge Road to Somersville Road	☒	☒	☒	☒	☒	☒
98157	Eastshore-North	Committed	Enhance AC Transit bus service in San Pablo corridor	☒	☒	☒	☒	☒	☒
98193	Delta	Committed	Extend Panoramic Drive from North Concord BART station to Willow Pass Road	☒	☒	☒	☒	☒	☒
98194	Diablo	Committed	Extend Commerce Avenue to Waterworld Parkway, including construction of vehicular bridge over Pine Creek, installation of trails and a pedestrian bridge and connecting Willow Pass Road to Concord Avenue/Route 242 interchange	☒	☒	☒	☒	☒	☒
98196	Diablo	Committed	Construct auxiliary lanes on Route 24 from Gateway Boulevard to Brookwood Road/Moraga Way	☒	☒	☒	☒	☒	☒
98198	Tri-Valley	New Commitment	Improve safety and operations on Vasco Road in Contra Costa County	☒	☐	☒	☒	☒	☒
98211	Eastshore-North	Committed	Extend I-80 eastbound HOV lanes from Route 4 to the Crockett interchange	☒	☒	☒	☒	☒	☒
98222	Delta	New Commitment	Construct freeway-to-freeway direct connectors between Route 4 Bypass and Route 160	☒	☐	☐	☐	☐	☐
98999	Delta	Committed	Widen Route 4 from Somersville Road to Route 160 and improve interchanges	☒	☒	☒	☒	☒	☒
230084	Eastshore-North	New Commitment	Construct a railroad grade separation at the Richmond Waterfront on the Marina Bay Parkway	☒	☐	☐	☐	☐	☐
230090	Contra Costa County-wide	New Commitment	Expand and enhance AC Transit facilities in western Contra Costa County, including environmental sustainability projects, zero emission improvements and a new operating facility	☒	☐	☐	☐	☐	☐
230123	Contra Costa County-wide	New Commitment	Expand existing WestCAT maintenance facility (includes land purchase)	☒	☐	☐	☐	☐	☐
230127	Contra Costa County-wide	Committed	Construct new satellite WestCAT maintenance facility (includes land purchase)	☒	☒	☒	☒	☒	☒

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Contra Costa									
230129	Contra Costa County-wide	Committed	Expand WestCAT service, including purchase of vehicles	☒	☒	☒	☒	☒	
230185	Contra Costa County-wide	New Commitment	Establish express bus service and eBART support network (includes park-and-ride lots and rolling stock)	☒	☐	☐	☐	☐	
230188	Delta	Committed	Purchase land in Oakley for use as a park-and-ride lot	☒	☒	☒	☒	☒	
230193	Eastshore-North	Committed	Enhance AC Transit Zero Emission Bus (ZEB) program, including fueling stations and new maintenance bays	☒	☒	☒	☒	☒	
230194	Eastshore-North	Committed	Implement AC Transit Environmental Sustainability Program	☒	☒	☒	☒	☒	
230195	Eastshore-North	Committed	Improve safety and security on AC Transit vehicles and in facilities, including installing surveillance systems and emergency operations improvements	☒	☒	☒	☒	☒	
230196	Eastshore-North	Committed	Implement AC Transit San Pablo Dam Road Transit Priority Measures (TPM), including passenger safety improvements and road improvements	☒	☒	☒	☒	☒	
230202	Delta	Committed	Widen Route 4 Bypass to 4 lanes from Laurel Road to Sand Creek Road	☒	☒	☒	☒	☒	
230203	Delta	Committed	Construct Route 4 Bypass interchange at Sand Creek Road	☒	☒	☒	☒	☒	
230205	Delta	Committed	Widen Route 4 Bypass to 4 lanes from Sand Creek Road to Balfour Road	☒	☒	☒	☒	☒	
230206	Delta	Committed	Construct Route 4 Bypass interchange at Balfour Road (Phase 1)	☒	☒	☒	☒	☒	
230212	Diablo	Committed	Improve Clayton Road/Treat Boulevard intersection and increase capacity (includes upgrading traffic signal and geometric improvements)	☒	☒	☒	☒	☒	
230216	Diablo	New Commitment	Construct 2-lane bridge connecting Waterworld Parkway with Meridian Park Boulevard	☒	☐	☐	☐	☐	
230225	Eastshore-North	Committed	Improve and expand arterial streets in central Hercules for express bus and rail transit facilities to support transit-oriented development at I-80/Route 4 intersection	☒	☒	☒	☒	☒	

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Contra Costa											
230227	Eastshore-North	Committed	Conduct engineering, environmental and financial feasibility assessment of rail mass transit to western Contra Costa County (includes future station site acquisition)	☒	☒	☒	☒	☒			
230229	Eastshore-North	New Commitment	Widen Pinole Valley Road ramps at I-80 to provide a dedicated right-turn lane on eastbound on-ramp and bus turnout/shelter on westbound on-ramp	☒	☐	☐	☐	☐			
230232	Delta	New Commitment	Construct new interchange at Route 4/Phillips Lane	☒	☐	☐	☐	☐			
230233	Delta	Committed	Extend James Donlon Boulevard to Kirker Pass Road by constructing a new 2-lane expressway	☒	☒	☒	☒	☒			
230236	Delta	Committed	Widen Pittsburg-Antioch Highway from 2 lanes to 4 lanes	☒	☒	☒	☒	☒			
230237	Delta	New Commitment	Extend West Leland Road from San Marco Boulevard to Willow Pass Road (includes a raised median, bicycle lanes and sidewalks)	☒	☐	☐	☐	☐			
230238	Delta	Committed	Widen California Avenue from 2 lanes to 4 lanes with 2 left-turn lanes	☒	☒	☒	☒	☒			
230239	Diablo	Committed	Widen and improve Buskirk Avenue between Monument Boulevard and Hookston Road to provide 2 through lanes in each direction (includes road realignment, new traffic signals and bicycle/pedestrian streetscape improvements)	☒	☒	☒	☒	☒			
230240	Diablo	New Commitment	Add additional left- or right-turn lanes at various intersections along Contra Costa Boulevard (between Monument Boulevard and 2nd Avenue)	☒	☐	☐	☐	☐			
230247	Delta	New Commitment	Widen Lone Tree Way to 6 lanes from O'Hara Avenue to Brentwood Boulevard	☒	☐	☐	☐	☐			
230249	Delta	Committed	Construct a 6-lane grade separation undercrossing along the Union Pacific Railroad line at Lone Tree Way	☒	☒	☒	☒	☒			
230250	Delta	Committed	Widen Brentwood Boulevard from 2 lanes to 4 lanes between Marsh Creek and Delta Road	☒	☒	☒	☒	☒			
230253	Delta	Committed	Replace the old 2-lane Fitzuren Road with a new, 4-lane divided arterial (includes shoulders, bicycle lanes, a park-and-ride lot and sidewalks)	☒	☒	☒	☒	☒			

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Contra Costa									
230274	Delta	Committed	Widen Main Street to 6 lanes from Route 160 to Big Break Road	☒	☒	☒	☒	☒	☒
230279	Eastshore-North	New Commitment	Extend John Muir Parkway in Hercules with 4 traffic lanes, a bridge, bicycle path and landscaping	☒	☐	☐	☐	☐	☐
230288	Delta	Committed	Widen Empire Avenue from 2 to 4 lanes between Lone Tree Way and Union Pacific Railroad right-of-way/Antioch city limits	☒	☒	☒	☒	☒	☒
230289	Delta	New Commitment	Construct Main Street Downtown Bypass road between Vintage Parkway and 2nd Street	☒	☐	☐	☐	☐	☐
230291	Delta	New Commitment	Add northbound truck climbing lane and a bicycle lane on Kirker Pass Road from Clearbrook Drive in Concord to just beyond the crest of Kirker Pass	☒	☐	☐	☐	☐	☐
230293	Eastshore-North	Committed	Add transit stops, sidewalks, and bicycle and pedestrian amenities on San Pablo Dam Road in El Sobrante	☒	☒	☒	☒	☒	☒
230306	Delta	New Commitment	Add a second southbound lane on Alhambra Avenue from Walnut Avenue to the south side of Highway 4 (includes signal modifications)	☒	☐	☐	☐	☐	☐
230307	Diablo	New Commitment	Widen Camino Tassajara Road from 2 lanes to 4 lanes from Windemere Parkway to the Alameda/Contra Costa County line	☒	☐	☐	☐	☐	☐
230308	Diablo	New Commitment	Straighten curves to improve safety and operation of Alhambra Valley Road	☒	☐	☒	☒	☒	☒
230309	Diablo	New Commitment	Provide rolling stock, infrastructure and information technology for Bus Rapid Transit service in the Pacheco/Contra Costa Boulevard/North Main corridor	☒	☐	☐	☐	☐	☐
230318	Eastshore-North	New Commitment	Extend North Richmond truck route along Soto Street from Market Avenue to Parr Boulevard	☒	☐	☐	☐	☐	☐
230320	Diablo	Committed	Extend the I-680 southbound HOV lane northward from Livorna Road to north of Rudgear Road	☒	☒	☒	☒	☒	☒
230321	Eastshore-North	New Commitment	Construct Phase 2 of Hercules Intermodal Station (includes station building and approximately 350 parking spaces)	☒	☐	☐	☐	☐	☐

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Contra Costa									
230397	Contra Costa County-wide	Committed	Construct and develop infrastructure enhancements to improve operations of transit service within the WestCAT service area, including park-and-ride lots, signal prioritization, bus-only lanes and freeway drop ramps	✓	✓	✓	✓	✓	
230401	Eastshore-North	Committed	Construct bicycle- and pedestrian-friendly improvements along San Pablo Avenue from El Cerrito to Crockett to support transit-oriented development	✓	✓	✓	✓	✓	
230402	Eastshore-North	Committed	Install new or upgraded corridor management and traveler information elements along the I-80 corridor from the Carquinez Bridge to the San Francisco-Oakland Bay Bridge Toll Plaza (Phase 1)	✓	✓	✓	✓	✓	
230505	Eastshore-North	Committed	Provide transportation improvements on the east side of the Richmond BART station to accommodate redevelopment for a transit village	✓	✓	✓	✓	✓	
230535	Delta	Committed	Realign curves along Marsh Creek Road to improve safety and operations	✓	✓	✓	✓	✓	
230538	Delta	Committed	Widen Bailey Road lanes and shoulders	✓	✓	✓	✓	✓	
230542	Eastshore-North	Committed	Close a bicycle/pedestrian gap at San Pablo Avenue bridge by upgrading the existing bridge or constructing a new dedicated bicycle/pedestrian bridge	✓	✓	✓	✓	✓	
230596	Diablo	Committed	Construct Pacheco Boulevard Transit Hub on Blum Road at the I-680/Route 4 interchange (includes 6 bus bays and a 110-space park-and-ride lot)	✓	✓	✓	✓	✓	
230597	Eastshore-North	Committed	Install new or upgraded corridor management and real-time traveler information improvements in I-80 corridor between the Carquinez Bridge and the San Francisco-Oakland Bay Bridge Toll Plaza (Phase 2)	✓	✓	✓	✓	✓	
230613	Transbay Bay Bridge	Committed	Implement ferry service between Hercules and San Francisco	✓	✓	✓	✓	✓	
230631	Diablo	Committed	Double the existing rail track between Oakley and Port Chicago	✓	✓	✓	✓	✓	
230693	Contra Costa County-wide	New Commitment	Local streets and roads maintenance	✓	□	✓	✓	✓	

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Marin									
21030	Golden Gate	New Commitment	Improve U.S. 101/I-580 interchange and construct a freeway-to-freeway direct connector from northbound U.S. 101 to eastbound I-580 (project approval and environmental design phases only)	☒	☐	☐	☐	☐	☐
21315	Golden Gate	New Commitment	Signalize ramp intersections at U.S. 101/Miller Creek Road interchange	☒	☐	☐	☐	☐	☐
21325	Golden Gate	New Commitment	Improve local access to U.S. 101 from Tamalpais Drive to just north of Sir Francis Drake Boulevard	☒	☐	☐	☐	☐	☐
22437	Golden Gate	New Commitment	Construct auxiliary lanes at various locations along U.S. 101 and provide bus-on-shoulder options where feasible	☒	☐	☐	☐	☐	☐
22753	Golden Gate	New Commitment	Construct park-and-ride lots to support regional express bus service	☒	☐	☐	☐	☐	☐
94563	Golden Gate	Committed	Widen U.S. 101 for HOV lanes (one in each direction) from Lucky Drive in Corte Madera to North San Pedro Road in San Rafael	☒	☒	☒	☒	☒	☒
98179	Golden Gate	New Commitment	Improve U.S. 101/Tiburon Boulevard interchange, including circulation and signal improvements to nearby intersections	☒	☐	☐	☐	☐	☐
230060	Marin County-wide	New Commitment	Implement Transit Priority Measures (TPM) on major transit corridors (includes signal priority, queue-jump lanes, real-time information and enhanced passenger board areas)	☒	☐	☐	☐	☐	☐
230095	Marin County-wide	Committed	Widen Route 1 at Pacific Way to provide a Muir Beach bus stop	☒	☒	☒	☒	☒	☒
230105	Marin County-wide	New Commitment	Replace Pacific Way Bridge with new two-lane bridge with a separate bicycle and pedestrian path	☒	☐	☐	☐	☐	☐
230252	Marin County-wide	New Commitment	Expand Marin County local bus service	☒	☐	☐	☐	☐	☐
230400	Marin County-wide	Committed	Improve access to Southern Marin parklands	☒	☒	☒	☒	☒	☒
230418	Marin County-wide	New Commitment	Rehabilitate major roads of countywide significance	☒	☐	☐	☐	☐	☐

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Marin

230431	Golden Gate	New Commitment	Construct intermodal transit hub in Southern Marin Priority Development Area and/or in the city of Novato	☒	☐		☐	☐	☐
230502	Transbay Bay Bridge	Committed	Construct westbound I-580 to northbound U.S. 101 connector	☒	☒		☒	☒	☒
230549	Marin County-wide	New Commitment	Implement local arterial improvements parallel to U.S. 101 (includes signal controller upgrades, signal coordination and geometric improvements)	☒	☐		☐	☐	☐
230694	Marin County-wide	New Commitment	Local streets and roads maintenance	☒	☐		☒	☒	☒

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Napa									
22746	Napa Valley	New Commitment	Widen Route 29/First Street overcrossing to 4 lanes	☒	☐	☐	☐	☐	☐
94076	Napa Valley	New Commitment	Construct the Trancas intermodal facility adjacent to the Route 29 and Redwood Road/Trancas Street interchange	☒	☐	☐	☐	☐	☐
230371	Napa Valley	New Commitment	Construct ADA-compliant pedestrian and bicycle path from Presidents Circle to railroad track in Yountville	☒	☐	☐	☐	☐	☐
230373	Napa Valley	New Commitment	Construct pedestrian and bicycle pathway from Madison Street to Solano Avenue	☒	☐	☐	☐	☐	☐
230374	Napa Valley	New Commitment	Construct pedestrian crosswalk at Charter Oak and Main Streets in St. Helena	☒	☐	☐	☐	☐	☐
230376	Napa Valley	New Commitment	Construct pedestrian and bicycle crossing at Tunnel of Elms in St. Helena	☒	☐	☐	☐	☐	☐
230377	Napa Valley	New Commitment	Construct pedestrian and bicycle crossing over Sulphur Creek at Oak Avenue in St. Helena	☒	☐	☐	☐	☐	☐
230378	Napa Valley	New Commitment	Implement accessibility improvement projects in downtown St. Helena, including curb cuts	☒	☐	☐	☐	☐	☐
230379	Napa Valley	New Commitment	Improve the truck route between Adams Street and Main Street	☒	☐	☐	☐	☐	☐
230381	Napa Valley	New Commitment	Improve signalization along Main Street in St. Helena	☒	☐	☐	☐	☐	☐
230387	Napa Valley	New Commitment	Construct a roundabout or improve traffic signals to improve safety at the Deer Park/Silverado Trail intersection	☒	☐	☒	☒	☒	☒
230388	Napa Valley	New Commitment	Improve the safety of the Oak Knoll/Silverado Trail intersection	☒	☐	☒	☒	☒	☒
230389	Napa Valley	New Commitment	Improve the safety of the Yountville Cross/Silverado Trail intersection	☒	☐	☒	☒	☒	☒
230390	Napa Valley	New Commitment	Improve the safety of the Oakville Crossroad/Route 29 intersection	☒	☐	☒	☒	☒	☒

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Napa									
230392	Napa Valley	New Commitment	Extend Devlin Road from Fagan Creek to Green Island Road	☒	☐	☐	☐	☐	
230393	Napa Valley	New Commitment	Construct middle-turn lane on Route 29 from Galleron Lane to St. Helena	☒	☐	☐	☐	☐	
230394	Napa County-wide	New Commitment	Improve the traffic signals at Solano and Wine Country avenues (includes road widening, drainage and rail crossing improvements)	☒	☐	☐	☐	☐	
230483	Napa Valley	New Commitment	Prepare Project Study Report (PSR) to improve Silverado Trail/Third/Coombsville/East intersection and improve Silverado Trail south of First Street	☒	☐	☐	☐	☐	
230484	Napa Valley	New Commitment	Install traffic signals on Imola Avenue at Route 29 ramps in Napa	☒	☐	☐	☐	☐	
230486	Napa Valley	New Commitment	Extend Devlin Road from Tower Road to Airpark Road in American Canyon	☒	☐	☐	☐	☐	
230498	Napa Valley	New Commitment	Construct Class I bicycle trail from Route 29 to Silverado Trail	☒	☐	☐	☐	☐	
230499	Napa Valley	New Commitment	Construct bicycle/pedestrian path from Oak Circle to south Yountville town limit	☒	☐	☐	☐	☐	
230508	Napa Valley	New Commitment	Elevate Solano Avenue from Yountville to Dry Creek Road	☒	☐	☐	☐	☐	
230518	Napa Valley	New Commitment	Construct a roundabout at Forest Road/Route 128	☒	☐	☒	☒	☒	
230519	Napa Valley	New Commitment	Improve the safety of the Route 29/Route 128 (Rutherford Crossroad) intersection by constructing a roundabout or improving signal operations	☒	☐	☐	☐	☐	
230599	North Bay East-West	New Commitment	Implement Phase 2 improvements to Route 12 (Jamieson Canyon), including grade realignment and full safety barrier	☒	☐	☐	☐	☐	
230622	Napa Valley	New Commitment	Construct new bicycle/pedestrian trail through American Canyon	☒	☐	☐	☐	☐	
230695	Napa County-wide	New Commitment	Local streets and roads maintenance	☒	☐	☒	☒	☒	

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San Francisco									
21502	San Francisco	New Commitment	Implement pedestrian projects, including sidewalk repair, crossing signal, signage improvements and an education campaign	☒	☐	☐	☐	☐	
21503	San Francisco	New Commitment	Implement a traffic calming program aimed at reducing auto traffic speeds and improving pedestrian and bicyclist safety throughout San Francisco	☒	☐	☐	☐	☐	
21504	San Francisco	New Commitment	Improve roadways throughout San Francisco by installing new traffic signs and signals, providing new transit lane markings, installing new parking meters and relocating a traffic maintenance shop	☒	☐	☐	☐	☐	
21505	San Francisco	New Commitment	Repair and retrofit local bridge structures and pedestrian overcrossings	☒	☐	☒	☒	☒	☒
21510	San Francisco	Committed	Extend the Third Street Light Rail line from north of King Street to Clay Street in Chinatown via a new Central Subway, including the purchase of light-rail vehicles	☒	☒	☒	☒	☒	☒
21533	San Francisco	New Commitment	Plant trees and maintain new and existing trees in public rights-of-way throughout San Francisco	☒	☐	☐	☐	☐	☐
21535	San Francisco	New Commitment	Implement Travel Demand Management (TDM) program, including transit route planning, bicycle and pedestrian planning and transit-oriented development studies and planning	☒	☐	☐	☐	☐	☐
21549	Peninsula	New Commitment	Implement direct access route from Hunters Point Shipyard to U.S. 101, including repaving existing roadway and adding new curbs and curb ramps, sidewalks, street lighting, trees and route signage	☒	☐	☐	☐	☐	☐
22249	San Francisco	New Commitment	Upgrade and extend streets and other vehicular facilities throughout San Francisco	☒	☐	☐	☐	☐	☐
22412	San Francisco	New Commitment	Purchase light-rail vehicles to expand Muni rail service	☒	☐	☐	☐	☐	☐
22415	San Francisco	New Commitment	Provide new historic streetcar service along the Embarcadero between the Caltrain Station and Fisherman's Wharf; extend streetcar service from Fisherman's Wharf to Fort Mason	☒	☐	☐	☐	☐	☐
22420	San Francisco	New Commitment	Implement Bus Rapid Transit (BRT) and Transit Preferential Streets (TPS) programs throughout San Francisco	☒	☐	☐	☐	☐	☐

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San Francisco									
22462	San Francisco	New Commitment	Implement bicycling programs, including construction and rehabilitation of bicycle lanes and paths; improve signage and crossings; and implement a public awareness campaign	☒	☐	☐	☐	☐	☐
22512	Transbay Bay Bridge	New Commitment	Provide capital improvements to support ferry service between Treasure Island and San Francisco	☒	☐	☐	☐	☐	☐
22982	San Francisco	New Commitment	Enhance transit programs in San Francisco that promote system connectivity and accessibility, close service gaps and expand transit service	☒	☐	☐	☐	☐	☐
22984	San Francisco	New Commitment	Construct new/reconstruct existing wheelchair curb ramps	☒	☐	☐	☐	☐	☐
94632	San Francisco	Committed	Extend Third Street Light Rail from Fourth and King Streets to Bayshore Caltrain Station	☒	☒	☒	☒	☒	☒
98593	San Francisco	New Commitment	Fund the Integrated Transportation Management System (SFgo)	☒	☐	☐	☐	☐	☐
230161	San Francisco	Committed	Implement a Bus Rapid Transit (BRT) project on Van Ness Avenue (includes dedicated transit lanes, signal priority and pedestrian and urban design upgrades)	☒	☒	☒	☒	☒	☒
230164	San Francisco	New Commitment	Implement a Bus Rapid Transit (BRT) project on Geary Boulevard (includes dedicated transit lanes, signal priority and pedestrian and urban design upgrades)	☒	☐	☐	☐	☐	☐
230168	San Francisco	New Commitment	Improve the Great Highway between Lincoln Way and 48th Avenue (includes resurfacing roadway, installing drainage systems and constructing medians)	☒	☐	☐	☐	☐	☐
230207	San Francisco	New Commitment	Implement a Bus Rapid Transit (BRT) project on the Geneva Avenue/Harney Way corridor (includes new infrastructure and rolling stock)	☒	☐	☐	☐	☐	☐
230211	San Francisco	New Commitment	Extend trolley coach infrastructure into Mission Bay along 16th Street and Third Street, and implement transit signal priority along 16th Street and Fillmore Street	☒	☐	☐	☐	☐	☐
230215	San Francisco	New Commitment	Extend existing trolley coach lines throughout San Francisco	☒	☐	☐	☐	☐	☐

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San Francisco									
230290	San Francisco	Committed	Extend Caltrain to Transbay Terminal and replace Transbay Terminal (Phase 2b)	☒	☐	☐	☐	☐	
230364	San Francisco	Committed	Improve water access to San Francisco parks	☒	☒	☒	☒	☒	
230490	San Francisco	New Commitment	Reconstruct and widen Harney Way to 8 lanes (6 mixed flow, 2 bus-only for Bus Rapid Transit service) and improve bicycle lanes and sidewalks	☒	☐	☐	☐	☐	
230517	San Francisco	New Commitment	Improve transit and roadway connectivity between San Francisco and San Mateo counties	☒	☐	☐	☐	☐	
230555	Transbay Bay Bridge	Committed	Reconstruct ramps on the east side of the San Francisco-Oakland Bay Bridge's Yerba Buena Island tunnel	☒	☒	☒	☒	☒	
230581	San Francisco	New Commitment	Improve San Francisco ferry infrastructure, including terminals, intermodal connections, ferry berths, emergency response systems and landside improvements	☒	☐	☐	☐	☐	
230585	San Francisco	New Commitment	Improve the functionality, safety and attractiveness of local streets and arterials in San Francisco	☒	☐	☐	☐	☐	
230594	San Francisco	New Commitment	Improve San Francisco BART stations to enhance passenger safety, accessibility and capacity, improve signage and provide real time transit information	☒	☐	☐	☐	☐	
230696	San Francisco	New Commitment	Local streets and roads maintenance	☒	☐	☒	☒	☒	

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San Mateo									
21602	Peninsula	New Commitment	Reconstruct U.S. 101/Broadway interchange	☒	☐	☐	☐	☐	☐
21603	Peninsula	New Commitment	Modify U.S. 101/Woodside Road interchange	☒	☐	☐	☐	☐	☐
21604	Peninsula	New Commitment	Construct auxiliary lanes (one in each direction) on U.S. 101 from Sierra Point to San Francisco County line	☒	☐	☐	☐	☐	☐
21606	Peninsula	Committed	Reconstruct U.S. 101/Willow Road interchange	☒	☒	☒	☒	☒	☒
21607	Peninsula	New Commitment	Modify University Avenue overcrossing of U.S. 101 to improve operational efficiency and safety (includes widening of overcrossing, constructing new southbound off-ramp and auxiliary lane, and adding bicycle lanes)	☒	☐	☐	☐	☐	☐
21608	Peninsula	Committed	Construct auxiliary lanes (one in each direction) on U.S. 101 from Marsh Road to Embarcadero Road	☒	☒	☒	☒	☒	☒
21609	Peninsula	Committed	Improve local access from Sneath Lane and San Bruno Avenue to I-280/I-380 interchange (study phase only)	☒	☒	☒	☒	☒	☒
21610	Peninsula	New Commitment	Construct auxiliary lanes (one in each direction) on U.S. 101 from San Bruno Avenue to Grand Avenue	☒	☐	☐	☐	☐	☐
21612	Peninsula	New Commitment	Improve access to/from west side of Dumbarton Bridge on Route 84 connecting to U.S. 101 (includes flyovers, interchange improvements and conversion of Willow Road between Route 84 and U.S. 101 to expressway)	☒	☐	☐	☐	☐	☐
21613	Peninsula	New Commitment	Improve Route 92 from San Mateo-Hayward Bridge to I-280 (includes widening and uphill passing lane from U.S. 101 to I-280)	☒	☐	☐	☐	☐	☐
21615	Peninsula	New Commitment	Reconstruct I-280/Route 1 interchange, including ramps	☒	☐	☐	☐	☐	☐
21623	Peninsula	New Commitment	Improve Caltrain stations (includes upgrades/relocation of platforms, new platforms, pedestrian tunnels, pedestrian crossings and parking improvements)	☒	☐	☐	☐	☐	☐
21624	San Mateo County-wide	New Commitment	Implement an incentive program to support transit-oriented developments within 1/2-mile of Caltrain stations that have a minimum density of 40 units per acre	☒	☐	☐	☐	☐	☐

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San Mateo									
21626	Peninsula	New Commitment	Implement Caltrain grade separation program	☒	☐	☐	☐	☐	☐
21892	Peninsula	New Commitment	Widen Woodside Road from 4 to 6 lanes from El Camino Real to Broadway	☒	☐	☐	☐	☐	☐
21893	Peninsula	New Commitment	Widen Route 92 from Half Moon Bay city limits and Pilarcitos Creek (includes widening shoulders and travel lanes to standard widths and straightening curves)	☒	☐	☐	☐	☐	☐
22120	Transbay San Mateo-	Committed	Construct ferry terminal at Redwood City	☒	☒	☒	☒	☒	☒
22226	Peninsula	New Commitment	Construct Bayshore Intermodal Facility for Caltrain, Muni light rail, and Muni and SamTrans buses (includes cross-platform transit transfers between Muni Third Street light-rail station and Caltrain Bayshore station)	☒	☐	☐	☐	☐	☐
22227	Peninsula	New Commitment	Extend Geneva Avenue to the U.S. 101/Candlestick Point interchange (includes Caltrain grade separation at Tunnel Avenue and other local street improvements)	☒	☐	☐	☐	☐	☐
22229	Peninsula	New Commitment	Reconstruct U.S. 101/Sierra Point Parkway interchange (includes extension of Lagoon Way to U.S. 101)	☒	☐	☐	☐	☐	☐
22230	Peninsula	New Commitment	Construct auxiliary lanes (one in each direction) on I-280 from I-380 to Hickey Boulevard	☒	☐	☐	☐	☐	☐
22232	Peninsula	Committed	Construct streetscape improvements on Mission Street (Route 82) from John Daly Boulevard to San Pedro Road	☒	☒	☒	☒	☒	☒
22239	Peninsula	New Commitment	Widen Manor Drive overcrossing at Route 1 (includes new traffic signals at intersection)	☒	☐	☐	☐	☐	☐
22261	Peninsula	New Commitment	Replace San Pedro Creek Bridge over Route 1	☒	☐	☐	☐	☐	☐
22268	San Mateo County-wide	New Commitment	Provide countywide shuttle service between Caltrain stations and major activity centers (includes purchase of vehicles)	☒	☐	☐	☐	☐	☐
22271	Peninsula	New Commitment	Widen Skyline Boulevard (Route 35) from 2 to 4 lanes between I-280 and Sneath Lane	☒	☐	☐	☐	☐	☐

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San Mateo									
22274	San Mateo County-wide	New Commitment	Install an Intelligent Transportation System (ITS) and a Traffic Operation System (TOS) countywide	☒	☐	☐	☐	☐	☐
22279	Peninsula	New Commitment	Construct new U.S. 101/Produce Avenue interchange (includes replacement of Produce Avenue on- and off-ramps and South Airport Boulevard ramps to U.S. 101 at Wondercolor Lane)	☒	☐	☐	☐	☐	☐
22282	Peninsula	New Commitment	Improve U.S. 101 operations near Route 92	☒	☐	☐	☐	☐	☐
22615	Transbay San Mateo-	Committed	Improve station facilities and other rail improvements in Redwood City, Menlo Park and East Palo Alto in conjunction with the Dumbarton Rail Corridor	☒	☒	☒	☒	☒	☒
22726	Peninsula	Committed	Implement ferry service between South San Francisco and Alameda/Oakland	☒	☒	☒	☒	☒	☒
22751	Peninsula	New Commitment	Improve operations and safety of Route 1 in Half Moon Bay (includes extending Route 1 to Half Moon Bay city limits and channelization at local intersections)	☒	☐	☐	☐	☐	☐
22756	Peninsula	New Commitment	Reconstruct U.S. 101/Candlestick Point interchange	☒	☐	☐	☐	☐	☐
94643	Peninsula	Committed	Widen Route 92 from Half Moon Bay city limits to Route 1 (includes adding left-turn lanes, signal modifications, shoulders and bicycle lanes)	☒	☒	☒	☒	☒	☒
94644	Peninsula	New Commitment	Construct westbound slow-vehicle lane on Route 92 from Route 35 to I-280	☒	☐	☐	☐	☐	☐
94656	Peninsula	Committed	Construct Devil's Slide Bypass between Montara and Pacifica	☒	☒	☒	☒	☒	☒
94667	San Mateo County-wide	Committed	Provide SamTrans Americans with Disabilities Act (ADA) paratransit services (includes operating support and purchase of new paratransit vehicles)	☒	☒	☒	☒	☒	☒
98176	Peninsula	Committed	Construct auxiliary lanes on U.S. 101 from 3rd Avenue to Millbrae and reconstruct U.S. 101/Peninsula interchange	☒	☒	☒	☒	☒	☒
98204	Peninsula	New Commitment	Add travel lane (one in each direction) on Route 1 (Calera Parkway) between Fassler Avenue and Westport Drive in Pacifica (includes traffic signal coordination on Fassler Avenue and Reina Del Mar Avenue)	☒	☐	☐	☐	☐	☐

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					No Project		HM/CPE	HM/CPE + Pricing	HM/CPE + Land
San Mateo									
230192	San Mateo County-wide	Committed	Improve SamTrans bus services (includes enhanced service levels, transit priority measures, signal timing and dedicated bus lanes)	☒	☒	☒	☒	☒	☒
230349	Peninsula	Committed	Improve local access to National Park Service (NPS) lands in San Mateo	☒	☒	☒	☒	☒	☒
230417	Peninsula	Committed	Modify U.S. 101/Holly Street interchange (includes widening eastbound to northbound loop to 2 lanes and eliminating northbound to westbound loop)	☒	☒	☒	☒	☒	☒
230424	Peninsula	Committed	Modify Route 92/El Camino Real interchange	☒	☒	☒	☒	☒	☒
230428	Peninsula	Committed	Extend Blomquist Street over Redwood Creek to East Bayshore and Bair Island Road	☒	☒	☒	☒	☒	☒
230430	Peninsula	Committed	Implement San Mateo's bicycle and pedestrian program	☒	☒	☒	☒	☒	☒
230434	Peninsula	Committed	Implement local circulation improvements and the local streets traffic management program	☒	☒	☒	☒	☒	☒
230592	Peninsula	Committed	Improve streetscape and traffic calming along Bay Road, and construct new northern access connection between Demeter Street and University Avenue	☒	☒	☒	☒	☒	☒
230697	San Mateo County-wide	New Commitment	Local streets and roads maintenance	☒	☐	☒	☒	☒	☒
230704	Peninsula	Committed	Make Route 92 operational improvements to Chess Drive on-ramps	☒	☒	☒	☒	☒	☒

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					No Project	HM/CPE = Heavy Maintenance/Climate Protection Emphasis			
						HM/CPE	HM/CPE + Pricing	HM/CPE + Land	
Santa Clara									
21702	Silicon Valley	New Commitment	Construct interchange at U.S. 101 and Buena Vista Avenue	☒	☐	☐	☐	☐	
21714	Silicon Valley	New Commitment	Widen U.S. 101 between Monterey Highway and Route 25 and construct an interchange at U.S. 101/Route 25/Santa Teresa Boulevard (includes extending Route 25 to Santa Teresa Boulevard)	☒	☐	☐	☐	☐	
21719	Silicon Valley	New Commitment	Improve I-880/I-280/Stevens Creek Boulevard interchange (includes eliminating eastbound off-ramp loop and reconfiguring the off-ramp to eastbound Stevens Creek Boulevard)	☒	☐	☐	☐	☐	
21720	Silicon Valley	New Commitment	Improve U.S. 101/Tennant Avenue interchange, including constructing a new bridge parallel to existing bridge over U.S. 101, widening Tennant Avenue from 2 lanes to 4 lanes with bicycle lanes and sidewalks, and adding a new northbound loop on-ramp	☒	☐	☐	☐	☐	
21722	Silicon Valley	New Commitment	Improve U.S. 101 southbound Trimble Road/De La Cruz Boulevard/Central Expressway interchange	☒	☐	☐	☐	☐	
21749	Silicon Valley	New Commitment	Extend Butterfield Boulevard from Tennant Avenue to Watsonville Road (includes railroad overpass bridge, drainage channel, traffic signal upgrade, median, landscaping, bicycle lanes and sidewalks)	☒	☐	☐	☐	☐	
21760	Silicon Valley	Committed	Double-track segments of the Caltrain line between San Jose and Gilroy	☒	☒	☒	☒	☒	
21785	Silicon Valley	New Commitment	Reconfigure local roadway and interchange at U.S. 101/Blossom Hill Road in San Jose (includes widening Blossom Hill Road over U.S. 101)	☒	☐	☐	☐	☐	
21787	Silicon Valley	Committed	Expand the Palo Alto Caltrain Station and Bus Transit Center	☒	☒	☒	☒	☒	
21790	Silicon Valley	Committed	Provide VTA's share of funds for additional train sets, passenger facilities, and service upgrades for the ACE service from San Joaquin and Alameda counties	☒	☒	☒	☒	☒	
21797	Silicon Valley	Committed	Implement Route 17 bus service improvements between downtown San Jose and downtown Santa Cruz	☒	☒	☒	☒	☒	
21921	Fremont-South Bay	Committed	Extend BART from Fremont to San Jose (includes environmental, preliminary engineering, property acquisition and construction phases)	☒	☒	☒	☒	☒	

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					No Project	HM/CPE	HM/CPE + Pricing	HM/CPE + Land	
Santa Clara									
21922	Silicon Valley	Committed	Implement the Mineta San Jose International Airport automated people-mover service	☒	☒	☒	☒	☒	☒
21923	Silicon Valley	Committed	Implement Bus Rapid Transit (BRT) on El Camino Real from Diridon Station to Palo Alto	☒	☒	☒	☒	☒	☒
22014	Silicon Valley	Committed	Implement Downtown East Valley Bus Rapid Transit (BRT) and Light Rail Phases 1 and 3	☒	☒	☒	☒	☒	☒
22019	Silicon Valley	Committed	Convert Bus Rapid Transit (BRT) to light-rail transit in the Santa Clara-Alum Rock corridor (Downtown East Valley Phase 2)	☒	☒	☒	☒	☒	☒
22118	Silicon Valley	New Commitment	Extend Hill Road from East Main Avenue to Peet Avenue	☒	☐	☐	☐	☐	☐
22134	Silicon Valley	Committed	Construct a lane on southbound U.S. 101 using the existing median from south of Story Road to Yerba Buena Road; modify the U.S. 101/Tully road interchange to a partial cloverleaf	☒	☒	☒	☒	☒	☒
22142	Silicon Valley	New Commitment	Improve U.S. 101/Capitol Expressway interchange (includes new northbound on-ramp from Yerba Buena Road)	☒	☐	☐	☐	☐	☐
22145	Silicon Valley	New Commitment	Widen westbound Route 237 on-ramp from Route 237 to northbound U.S. 101 to 2 lanes and add auxiliary lane on northbound U.S. 101 from Route 237 on-ramp to Ellis Street interchange (includes Traffic Operation System/TOS elements)	☒	☐	☐	☐	☐	☐
22153	Silicon Valley	New Commitment	Extend Mary Avenue north across Route 237 (includes reconfiguring the Mathilda Avenue/U.S. 101 interchange)	☒	☐	☐	☐	☐	☐
22156	Silicon Valley	New Commitment	Improve Route 85 northbound to Route 237 eastbound connector ramp	☒	☐	☐	☐	☐	☐
22162	Silicon Valley	New Commitment	Improve Route 237 westbound to Route 85 southbound connector ramp (includes widening off-ramp to Route 85 to 2 lanes and adding a southbound auxiliary lane between Route 237 and El Camino Real interchange on Route 85)	☒	☐	☐	☐	☐	☐
22175	Silicon Valley	New Commitment	Widen Almaden Expressway to 8 lanes between Coleman Road and Blossom Hill Road	☒	☐	☐	☐	☐	☐

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Santa Clara

22179	Silicon Valley	New Commitment	Widen Central Expressway from 4 to 6 lanes between Lawrence Expressway and San Tomas Expressway	☒	☐		☐	☐	☐
22180	Silicon Valley	New Commitment	Widen Central Expressway between Lawrence Expressway and Mary Avenue to provide auxiliary lanes	☒	☐		☐	☐	☐
22186	Silicon Valley	New Commitment	Widen San Tomas Expressway to 8 lanes between El Camino Real (Route 82) and Williams Road	☒	☐		☐	☐	☐
22809	Silicon Valley	New Commitment	Realign DeWitt Avenue/Sunnyside Avenue intersection	☒	☐		☐	☐	☐
22814	Silicon Valley	New Commitment	Extend Foothill Expressway westbound deceleration lane at San Antonio Road	☒	☐		☐	☐	☐
22815	Silicon Valley	New Commitment	Upgrade Miramonte Avenue bikeway to Class II between Mountain View and Foothill Expressway	☒	☐		☐	☐	☐
22822	Santa Clara County-wide	New Commitment	Provide real-time expressway traffic information in Santa Clara county	☒	☐		☐	☐	☐
22839	Silicon Valley	Committed	Convert the HOV lane on Central Expressway between San Tomas and De La Cruz to a general purpose lane	☒	☒		☒	☒	☒
22842	Silicon Valley	New Commitment	Improve Route 152/Ferguson Road intersection, includes lighting and widening	☒	☐		☐	☐	☐
22843	Silicon Valley	New Commitment	Widen Lawrence Expressway from 6 to 8 lanes between Moorpark Avenue/Bollinger Road and south of Calvert Court	☒	☐		☐	☐	☐
22854	Silicon Valley	New Commitment	Improve bicycle/pedestrian safety at I-280/Oregon-Page Mill interchange	☒	☐		☐	☐	☐
22873	Silicon Valley	New Commitment	Widen Loyola Bridge over Foothill Expressway to add a third lane for left turns and improve bicycle/pedestrian access	☒	☐		☐	☐	☐
22878	Silicon Valley	New Commitment	Realign Wildwood Avenue to connect with Lawrence Expressway (includes new traffic signal)	☒	☐		☐	☐	☐

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Santa Clara									
22883	Silicon Valley	New Commitment	Modify medians on Lawrence Expressway (including those at Lochinvar Avenue, De Sota Avenue, Golden State Drive, Granada Avenue, Buckley Street and St. Lawrence Drive/Lawrence Station Road) for limited access	☒	☐	☐	☐	☐	☐
22895	Silicon Valley	New Commitment	Improve the operations of San Tomas Expressway/Route 17 interchange (includes restriping the eastbound through lane on White Oaks Road and adding a second right-turn lane on the southbound off-ramp)	☒	☐	☐	☐	☐	☐
22909	Silicon Valley	Committed	Fund the operating and capital needs of Measure A transit services	☒	☒	☒	☒	☒	☒
22910	Silicon Valley	New Commitment	Add Traffic Operations System (TOS) infrastructure on Santa Teresa Boulevard between Day Road and Mesa Road	☒	☐	☐	☐	☐	☐
22925	Silicon Valley	New Commitment	Realign existing curve on DeWitt Avenue between Edmundson Avenue and Spring Avenue	☒	☐	☒	☒	☒	☒
22944	Santa Clara County-wide	Committed	Widen I-880 for HOV lanes in both directions from Route 237 in Milpitas to U.S. 101 in San Jose	☒	☒	☒	☒	☒	☒
22956	Silicon Valley	Committed	Extend the Capitol Avenue light-rail line from the Alum Rock Transit Center to a rebuilt Eastridge Transit Center	☒	☒	☒	☒	☒	☒
22965	Silicon Valley	New Commitment	Construct U.S. 101/Mabury Road/Taylor Street interchange	☒	☐	☐	☐	☐	☐
22978	Silicon Valley	Committed	Extend the Capitol Expressway light-rail transit (LRT) from Eastridge Transit Center to the Capitol Station on the Guadalupe LRT line in Nieman (Phase 2)	☒	☒	☒	☒	☒	☒
94117	Silicon Valley	Committed	Improve bus stop accessibility systemwide (includes new transit centers and park-and-ride lots at De Anza College, Vasona Junction and downtown Los Gatos)	☒	☒	☒	☒	☒	☒
98119	Silicon Valley	Committed	Extend light-rail transit from Winchester Station to Route 85 (Vasona Junction)	☒	☒	☒	☒	☒	☒
230174	Santa Clara County-wide	New Commitment	Construct a 4-lane bridge across Uvas Creek connecting the east and west sides of Tenth Street, including 4 travel lanes, bicycle lanes, sidewalks and a new traffic signal at the intersection of Tenth Street and Uvas Park Drive)	☒	☐	☐	☐	☐	☐

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Santa Clara									
230175	Santa Clara County-wide	New Commitment	Construct a new 2-lane overcrossing on Las Animas Avenue at U.S. 101 (includes shoulders, bicycle lanes and sidewalks)	☒	☐	☐	☐	☐	☐
230200	Santa Clara County-wide	New Commitment	Improve local circulation on St. John Street and Autumn Street	☒	☐	☐	☐	☐	☐
230201	Santa Clara County-wide	New Commitment	Widen Coleman Avenue from 4 to 6 lanes from I-880 to Taylor Street	☒	☐	☐	☐	☐	☐
230210	Silicon Valley	New Commitment	Rebuild box culvert under San Tomas Expressway	☒	☐	☒	☒	☒	☒
230242	Silicon Valley	New Commitment	Add Capitol Expressway Traffic Operations System (TOS) between U.S. 101 and Almaden Expressway	☒	☐	☐	☐	☐	☐
230246	Santa Clara County-wide	New Commitment	Improve intersection at Lawrence Expressway and Prospect Road by adding a second left-turn lane and modifying the existing traffic signals	☒	☐	☐	☐	☐	☐
230251	Santa Clara County-wide	New Commitment	Improve expressway traffic operations system (TOS) in Santa Clara county (includes automated traffic count collection system, wireless controller communication system, wireless vehicular detection system, and signal and video infrastructure upgrades)	☒	☐	☐	☐	☐	☐
230262	Silicon Valley	New Commitment	Construct a new interchange at U.S. 101 and Montague Expressway	☒	☐	☐	☐	☐	☐
230265	Silicon Valley	New Commitment	Improve the operations of the intersection of Montague Expressway and Mission College Boulevard	☒	☐	☐	☐	☐	☐
230267	Silicon Valley	Committed	Widen Montague Expressway to 8 lanes for HOV lanes between Lick Mill and Trade Zone boulevards and on Guadalupe River Bridge and Penitencia Creek Bridge	☒	☒	☒	☒	☒	☒
230269	Silicon Valley	Committed	Construct a new interchange at Trimble Road and Montague Expressway	☒	☒	☒	☒	☒	☒
230273	Silicon Valley	New Commitment	Widen Montague Expressway to 8 lanes between Trade Zone Boulevard and I-680 and to 6 lanes between I-680 and Park Victoria Drive for HOV lanes	☒	☐	☐	☐	☐	☐
230292	Santa Clara County-wide	New Commitment	Implement signal coordination between expressway and major cross-street signals in Santa Clara county	☒	☐	☐	☐	☐	☐

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Santa Clara									
230294	Santa Clara County-wide	Committed	Conduct environmental and design studies to widen and create new alignment for Route 152 (from Route 156 to U.S. 101)	☒	☒	☒	☒	☒	
230298	Silicon Valley	New Commitment	Replace Calaveras Boulevard 4-lane bridge over the Union Pacific Railroad tracks with new 6-lane structure with bicycle and pedestrian facilities and circulation improvements	☒	☐	☐	☐	☐	
230302	Silicon Valley	New Commitment	Improve the intersection of Dixon Landing Road and North Milpitas Boulevard	☒	☐	☐	☐	☐	
230339	Silicon Valley	Committed	Convert HOV queue-jump lanes along Central Expressway at Bowers Avenue to general purpose lanes	☒	☒	☒	☒	☒	
230347	Santa Clara County-wide	New Commitment	Improve U.S. 101 southbound ramps at 10th Street	☒	☐	☐	☐	☐	
230350	Santa Clara County-wide	New Commitment	Widen southbound U.S. 101 off-ramp at Cochrane Road from 2 to 3 lanes	☒	☐	☐	☐	☐	
230356	Silicon Valley	Committed	Construct interchange at Lawrence Expressway and Arques Avenue	☒	☒	☒	☒	☒	
230363	Silicon Valley	Committed	Construct interchange at I-880 and Montague Expressway (includes improvements to Montague Expressway)	☒	☒	☒	☒	☒	
230385	Peninsula	New Commitment	Purchase and install emergency vehicle pre-emption detectors and video detection cameras at signalized intersections in downtown Palo Alto	☒	☐	☒	☒	☒	
230407	Santa Clara County-wide	New Commitment	Widen Route 17 off-ramp southbound at Hamilton Avenue	☒	☐	☐	☐	☐	
230445	Santa Clara County-wide	New Commitment	Improve Great America Parkway and Mission College Boulevard intersection (includes adding triple left-turn lanes in two directions and traffic signal upgrades)	☒	☐	☐	☐	☐	
230449	Santa Clara County-wide	New Commitment	Extend Charcot Avenue over I-880 as a new 2-lane roadway with bicycle and pedestrian improvements to connect to North San Jose employment center	☒	☐	☐	☐	☐	
230451	Santa Clara County-wide	New Commitment	Rehabilitate Fatjo Place, Thompson Place, Arguello Place, Bray Avenue and Graham Lane	☒	☐	☐	☐	☐	

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Santa Clara									
230452	Santa Clara County-wide	New Commitment	Convert downtown one-way couplets to two-way streets along 10th/11th Streets, Almaden Boulevard/Vine Street and 2nd/3rd Streets	☒	☐	☐	☐	☐	☐
230454	Santa Clara County-wide	Committed	Construct bicycle overcrossing at Blossom Hill/Monterey Highway area over Union Pacific Railroad tracks	☒	☒	☒	☒	☒	☒
230456	Santa Clara County-wide	Committed	Widen Zanker Road from 4 to 6 lanes	☒	☒	☒	☒	☒	☒
230457	Santa Clara County-wide	New Commitment	Improve Oakland Road from U.S. 101 to Montague Expressway by providing landscaping and operational improvements	☒	☐	☐	☐	☐	☐
230458	Santa Clara County-wide	New Commitment	Widen Berryessa Road from U.S. 101 to I-680 to provide access to planned Berryessa BART station	☒	☐	☐	☐	☐	☐
230459	Santa Clara County-wide	New Commitment	Extend Chynoweth Avenue from Almaden Expressway to Winfield Road	☒	☐	☐	☐	☐	☐
230460	Santa Clara County-wide	New Commitment	Widen Snell Avenue from Branham Lane to Chynoweth Avenue	☒	☐	☐	☐	☐	☐
230461	Santa Clara County-wide	New Commitment	Widen Branham Lane from Vista Park Drive to Snell Avenue (includes bicycle and pedestrian facilities)	☒	☐	☐	☐	☐	☐
230471	Santa Clara County-wide	Committed	Widen intersections and improve sidewalks throughout the city of Sunnyvale	☒	☒	☒	☒	☒	☒
230531	Santa Clara County-wide	Committed	Construct HOV and auxiliary lanes on U.S. 101 in Mountain View and Palo Alto, from Route 85 to Embarcadero Road	☒	☒	☒	☒	☒	☒
230532	Santa Clara County-wide	Committed	Improve interchange at Route 237/North 1st Street	☒	☒	☒	☒	☒	☒
230534	Santa Clara County-wide	Committed	Electrify Caltrain line from Tamien Station to Gilroy	☒	☒	☒	☒	☒	☒
230547	Santa Clara County-wide	Committed	Implement Bus Rapid Transit (BRT) on Monterey Highway	☒	☒	☒	☒	☒	☒
230551	Santa Clara County-wide	Committed	Implement the Zero Emissions Bus (ZEB) program	☒	☒	☒	☒	☒	☒

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Santa Clara									
230552	Santa Clara County-wide	Committed	Install and modify VTA facilities to support the Zero Emissions Bus (ZEB) program	☒	☒	☒	☒	☒	
230554	Santa Clara County-wide	Committed	Implement Bus Rapid Transit (BRT) between Sunnyvale and Cupertino	☒	☒	☒	☒	☒	
230573	Santa Clara County-wide	New Commitment	Improve ramps and intersections on Fremont and Bernardo Avenues at Route 85	☒	☐	☐	☐	☐	
230574	Santa Clara County-wide	Committed	Improve the Route 85/Cottle Road interchange	☒	☒	☒	☒	☒	
230577	Santa Clara County-wide	New Commitment	Improve ramp and intersection on Route 152 eastbound at Bloomfield Avenue	☒	☐	☐	☐	☐	
230579	Santa Clara County-wide	New Commitment	Improve ramp/intersection on Route 152 eastbound at Frazier Lake Road	☒	☐	☐	☐	☐	
230584	Santa Clara County-wide	New Commitment	Improve ramp/intersection at Route 152 westbound at Watsonville Road	☒	☐	☐	☐	☐	
230595	Santa Clara County-wide	Committed	Implement Bus Rapid Transit (BRT) on Stevens Creek Boulevard from Diridon Station to DeAnza College	☒	☒	☒	☒	☒	
230641	Santa Clara County-wide	Committed	Implement bicycle and pedestrian improvements in North San Jose	☒	☒	☒	☒	☒	
230644	Santa Clara County-wide	Committed	Implement miscellaneous intersection improvements in North San Jose	☒	☒	☒	☒	☒	
230645	Santa Clara County-wide	Committed	Implement improvements to the North First Street Core Area grid	☒	☒	☒	☒	☒	
230698	Santa Clara County-wide	New Commitment	Local streets and roads maintenance	☒	☐	☒	☒	☒	
230705	Santa Clara County-wide	Committed	Improve local interchanges and auxiliary lanes	☒	☒	☒	☒	☒	
230706	Santa Clara County-wide	Committed	Make local streets and roads improvements (includes street channelization, overcrossings, bicycle and pedestrian access, and safety improvements)	☒	☒	☒	☒	☒	

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					No Project		HM/CPE	HM/CPE + Pricing	HM/CPE + Land
Solano									
21341	Eastshore-North	New Commitment	Construct new Fairfield/Vacaville multimodal train station for Capitol Corridor intercity rail service (Phases 1, 2 and 3)	☒	☐	☐	☐	☐	☐
22629	Eastshore-North	New Commitment	Construct new Vallejo Baylink Ferry Terminal (includes additional parking, upgrade of bus transfer facilities and pedestrian access improvements)	☒	☐	☐	☐	☐	☐
22630	Eastshore-North	Committed	Improve Parkway Boulevard overcrossing over Union Pacific Railroad tracks	☒	☒	☒	☒	☒	☒
22631	Eastshore-North	Committed	Construct Route 12 westbound truck climbing lane at Red Top Road	☒	☒	☒	☒	☒	☒
22632	Eastshore-North	Committed	Widen American Canyon Road overpass at I-80	☒	☒	☒	☒	☒	☒
22633	Eastshore-North	Committed	Widen Azuar Drive/Cedar Avenue from 2 to 4 lanes between P Street and Residential Parkway (includes bicycle lanes, railroad signals and rehabilitation improvements)	☒	☒	☒	☒	☒	☒
22634	Eastshore-North	Committed	Construct an adjacent 200-space, at-grade parking lot at the Vacaville Intermodal Station (Phase 1)	☒	☒	☒	☒	☒	☒
22700	Eastshore-North	New Commitment	Construct parallel corridor north of I-80 from Red Top Road to Abernathy Road	☒	☐	☐	☐	☐	☐
94151	Eastshore-North	New Commitment	Construct 4-lane Jepson Parkway from Route 12 to Leisure Town Road	☒	☐	☐	☐	☐	☐
230311	Solano County-wide	Committed	Widen and improve Peterson Road with the addition of a truck-stacking lane (includes drainage improvements)	☒	☒	☒	☒	☒	☒
230322	Eastshore-North	Committed	Rebuild and relocate eastbound Cordelia Truck Scales Facility (includes a new 4-lane bridge across Suisun Creek and new ramps at eastbound Route 12 and eastbound I-80)	☒	☒	☒	☒	☒	☒
230326	Eastshore-North	New Commitment	Improve I-80/I-680/Route 12 interchange, including connecting I-680 northbound to Route 12 westbound (Jamieson Canyon), adding connectors and reconstructing local interchanges (Phase 1)	☒	☐	☐	☐	☐	☐

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Reference Number	Corridor	Investment Type*	Project/Program	Transportation 2035 Plan (Proposed Project)	Alternatives		HM/CPE = Heavy Maintenance/Climate Protection Emphasis		
					No Project	HM/CPE	HM/CPE + Pricing	HM/CPE + Land	
Solano									
230468	Eastshore-North	New Commitment	Provide auxiliary lanes on I-80 in eastbound and westbound directions from I-680 to Air Base Parkway (includes a new eastbound mixed flow lane from Route 12 east to Air Base Parkway)	☒	☐	☐	☐	☐	
230635	Eastshore-North	New Commitment	Construct new 400-space parking garage at the Vacaville Intermodal Station (Phase 2)	☒	☐	☐	☐	☐	
230650	Eastshore-North	Committed	Widen I-80 from Red Top Road to Air Base Parkway to add HOV lanes in both directions (includes pavement rehabilitation and ramp metering)	☒	☒	☒	☒	☒	
230699	Solano County-wide	New Commitment	Local streets and roads maintenance	☒	☐	☒	☒	☒	
230708	Solano County-wide	Committed	Improve local interchanges and auxiliary lanes and make local streets and roads improvements (includes street channelization, overcrossings, bicycle and pedestrian access, and safety improvements)	☒	☒	☒	☒	☒	

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Reference Number	Corridor	Investment Type*	Project/Program	Transportation 2035 Plan (Proposed Project)	Alternatives		HM/CPE = Heavy Maintenance/Climate Protection Emphasis		
					No Project	HM/CPE	HM/CPE + Pricing	HM/CPE + Land	
Sonoma									
21070	North Bay East-West	Committed	Realign and widen Route 116 (Stage Gulch Road) along Champlin Creek to improve safety, adding shoulders to accommodate pedestrians and bicyclists	☒	☒	☒	☒	☒	☒
21884	Golden Gate	Committed	Construct Petaluma crosstown connector/interchange	☒	☒	☒	☒	☒	☒
21902	Golden Gate	Committed	Widen U.S. 101 for HOV lanes from Pepper Road to Rohnert Park Expressway (Central Phase A)	☒	☒	☒	☒	☒	☒
21908	Golden Gate	Committed	Study the environmental impacts of a future Port Sonoma ferry service and facility	☒	☒	☒	☒	☒	☒
22190	North Bay East-West	New Commitment	Improve channelization and traffic signalization at Route 116/Route 121 intersection (includes Arnold Drive improvements)	☒	☐	☐	☐	☐	☐
22191	Golden Gate	New Commitment	Improve U.S. 101 North/Airport Boulevard interchange (includes widening Airport Boulevard to 2 lanes in each direction and adding turn lanes)	☒	☐	☐	☐	☐	☐
22193	Golden Gate	New Commitment	Construct new bypass on Route 116 in Forestville	☒	☐	☐	☐	☐	☐
22194	Golden Gate	New Commitment	Improve safety on Mark West Springs Road/Porter Creek Road (includes adding standard shoulders and turn pockets)	☒	☐	☒	☒	☒	☒
22195	Golden Gate	New Commitment	Improve U.S. 101/Old Redwood Highway interchange (includes modifying/replacing existing 2-lane interchange to at least a 5-lane interchange and improving ramps)	☒	☐	☐	☐	☐	☐
22197	Golden Gate	New Commitment	Improve local circulation at various locations in Town of Penngrove (includes improvements to Main Street, Petaluma Hill Road, Adobe Road, Old Redwood Highway and U.S. 101/Railroad Avenue)	☒	☐	☐	☐	☐	☐
22203	Golden Gate	New Commitment	Improve channelization and traffic signalization on River Road from Fulton Road to the town of Guerneville	☒	☐	☐	☐	☐	☐
22204	Golden Gate	New Commitment	Widen Fulton Road from 2 to 4 lanes from Guerneville Road to U.S. 101 and construct Route 12/Fulton Road interchange	☒	☐	☐	☐	☐	☐
22205	Golden Gate	New Commitment	Improve U.S. 101/Hearn Avenue interchange (includes widening overcrossing and ramps)	☒	☐	☐	☐	☐	☐

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Reference Number	Corridor	Investment Type*	Project/Program	Transportation 2035 Plan (Proposed Project)	Alternatives		HM/CPE = Heavy Maintenance/Climate Protection Emphasis		
					No Project	HM/CPE	HM/CPE + Pricing	HM/CPE + Land	
Sonoma									
22207	Golden Gate	New Commitment	Extend Farmers Lane from Bellevue Avenue to Bennett Valley Road as a 3-lane or 4-lane arterial (includes a bicycle lane and sidewalk)	☒	☐	☐	☐	☐	
22438	Golden Gate	New Commitment	Improve Bodega Highway west of Sebastopol (includes straightening curves near Occidental and adding turn pockets)	☒	☐	☐	☐	☐	
22490	Sonoma County-wide	New Commitment	Convert bridges in Sonoma County from 1-lane to 2-lane	☒	☐	☐	☐	☐	
22652	Golden Gate	Committed	Rehabilitate pavement on U.S. 101 from Steele Lane to Grant Avenue overhead in Healdsburg	☒	☒	☒	☒	☒	
22655	Golden Gate	Committed	Widen U.S. 101 for HOV lanes (one in each direction) from Rohnert Park Expressway to Santa Rosa Avenue (includes interchange improvements and ramp metering)	☒	☒	☒	☒	☒	
22656	Golden Gate	Committed	Improve U.S. 101/East Washington Street interchange (includes new northbound on-ramp and improvements to southbound on-ramp)	☒	☒	☒	☒	☒	
94689	Golden Gate	New Commitment	Improve U.S. 101/Arata Lane interchange in Windsor, including new on- and off-ramps and realignment of Los Amigos Road north of Arata Lane (Phase 4)	☒	☐	☐	☐	☐	
94691	North Bay East-West	New Commitment	Install traffic signal system on Route 121 and improve channelization at 8th Street	☒	☐	☐	☐	☐	
98183	Golden Gate	Committed	Widen U.S. 101 for HOV lanes between Steele Lane and Windsor River Road (Phase A)	☒	☒	☒	☒	☒	
230341	Sonoma County-wide	New Commitment	Improve channelization and traffic signalization on Mirabel Road and Route 116	☒	☐	☐	☐	☐	
230345	Golden Gate	New Commitment	Rehabilitate or replace existing Healdsburg Avenue Bridge	☒	☐	☒	☒	☒	
230437	Sonoma County-wide	New Commitment	Provide infrastructure for two high-frequency Bus Rapid Transit corridors in Santa Rosa (includes vehicle purchases, infrastructure such as bus stops/intermodal nodes, and technology support)	☒	☐	☐	☐	☐	
230442	Sonoma County-wide	New Commitment	Implement service enhancements for Santa Rosa CityBus (includes technology enhancements such as video, automatic vehicle location and farebox upgrades, operations and maintenance facilities improvements and vehicle purchases)	☒	☐	☐	☐	☐	

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Reference Number	Corridor	Investment Type*	Project/Program	Transportation 2035 Plan (Proposed Project)	Alternatives				
					No Project	HM/CPE	HM/CPE + Pricing	HM/CPE + Land	HM/CPE = Heavy Maintenance/ Climate Protection Emphasis
Sonoma									
230700	Sonoma County-wide	New Commitment	Local streets and roads maintenance	☒	☐	☒	☒	☒	

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Appendix D: Biological Resources Regulatory Setting and Detailed Tables

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Biological Resources Regulatory Setting and Detailed Tables

National Environmental Policy Act

The National Environmental Policy Act (NEPA) was enacted in 1969 and is the first law to require a federal action to be reviewed for its potential impacts on the environment. NEPA is a national policy that requires federal agencies to consider the environmental consequences of their actions. NEPA is a key component of the federal regulatory system and is used to ensure that federal actions are consistent with the national environmental policy. NEPA is a key component of the federal regulatory system and is used to ensure that federal actions are consistent with the national environmental policy.

NEPA requires federal agencies to prepare an environmental impact statement (EIS) for major federal actions that significantly affect the environment. The EIS is a document that describes the proposed action, the environmental impacts of the action, and the alternatives to the action. The EIS is a key component of the federal regulatory system and is used to ensure that federal actions are consistent with the national environmental policy. NEPA is a key component of the federal regulatory system and is used to ensure that federal actions are consistent with the national environmental policy.

Endangered Species Act

The Endangered Species Act (ESA) was enacted in 1973 and is the first law to require a federal action to be reviewed for its potential impacts on the environment. The ESA is a national policy that requires federal agencies to consider the environmental consequences of their actions. The ESA is a key component of the federal regulatory system and is used to ensure that federal actions are consistent with the national environmental policy.

California Environmental Quality Act

The California Environmental Quality Act (CEQA) was enacted in 1970 and is the first law to require a federal action to be reviewed for its potential impacts on the environment. CEQA is a national policy that requires federal agencies to consider the environmental consequences of their actions. CEQA is a key component of the federal regulatory system and is used to ensure that federal actions are consistent with the national environmental policy.

Appendix D: Biological Resources

Regulatory Setting and Detailed Tables

Regulations for biological resources are quite extensive, thus they are provided here in the appendix in order to facilitate navigation of the biological resources chapter. Also provided here are the detailed tables of species status species that can be found in the Bay Area.

REGULATORY SETTING

FEDERAL REGULATIONS

National Environmental Policy Act

The National Environmental Policy Act of 1969 (NEPA) was one of the first laws to establish a broad national framework for protecting the environment. Its purposes include: “To declare a national policy which will encourage productive and enjoyable harmony between man and his environment; [and] to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man.” NEPA assures that all branches of government give proper consideration to the environment prior to undertaking major federal actions that could significantly affect the environment.

Environmental assessments (EAs) and environmental impact statements (EISs), which assess the likelihood of impacts from alternative courses of action, are required from all federal agencies and are the most visible NEPA requirements. The documents must include discussion of the environmental impacts of the alternatives, including the proposed action; any adverse environmental effects that cannot be avoided should the proposal be implemented; the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity; and any irreversible or irretrievable commitments of resources that would be involved in the proposal should it be implemented.

Federal Endangered Species Act

Under the Federal Endangered Species Act (FESA), the Secretary of the Interior and the Secretary of Commerce have joint authority to list a species as threatened or endangered (16 United States Code [USC] 1533[c]). Pursuant to the requirements of FESA, an agency reviewing a proposed project within its jurisdiction must determine whether any federally listed or proposed species may be present in the project region, and whether the proposed project would result in a “take”¹

¹ “Take,” as defined in Section 9 of the FESA, is broadly defined to include intentional or accidental “harassment” or “harm” to wildlife. “Harass” is further defined by the U.S. Fish and Wildlife Service as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, and sheltering. “Harm” is defined as an act

of such species. In addition, the agency is required to determine whether the project is likely to jeopardize the continued existence of any species proposed to be listed under FESA, or result in the destruction or adverse modification of critical habitat proposed to be designated for such species (16 USC 1536[3][4]). Project-related impacts to these species or their habitats would be considered significant in this EIR. The “take” prohibition of FESA applies to any action that would adversely affect a single member of an endangered or threatened species.

Proposed and Candidate Species for Listing as Endangered or Threatened

Proposed species are granted limited protection under FESA and must be addressed in Biological Assessments (under Section 7 of the act); proposed species otherwise have no protection from “take” under federal law, except emergency-listed species.² Candidate species are afforded no protection under the act. The U.S. Fish and Wildlife Service (USFWS) typically reviews project plans and species information to determine the effects of federal actions on a proposed or candidate species. Any recommendations to modify or abandon the project and/or undertake protective measures for proposed or candidate species are not mandatory on the federal agency conferring with the USFWS. The USFWS recommends that candidate species and species proposed for listing also be considered in informal consultation during a project’s environmental review. This is recommended because, in the event that a species were to be listed during the design or construction phases of a project (i.e., before occupancy), new studies and restrictions could be imposed.

Migratory Bird Treaty Act and Bald Eagle Protection Act

The federal Migratory Bird Treaty Act (16 USC, Section 703, Supplement I, 1989) prohibits killing, possessing, or trading in migratory birds, except in accordance with regulations prescribed by the Secretary of the Interior. This act encompasses whole birds, parts of birds, and bird nests and eggs.

The federal Bald Eagle Protection Act prohibits persons within the United States (or other places subject to U.S. jurisdiction) from “possessing, selling, purchasing, offering to sell, transporting, exporting or importing any bald eagle or any golden eagle, alive or dead, or any part, nest or egg thereof.”

Clean Water Act

The Clean Water Act is a 1977 amendment to the Federal Water Pollution Control Act of 1972, which set the basic structure for regulating discharges of pollutants to waters of the United States. Although the purpose of the act is primarily to maintain water quality for both human and environmental benefits, regulations developed pursuant to this act deal extensively with permitting of actions in wetlands. These regulations provide more specific protection for wetland

which actually kills or injures wildlife. This may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.

² Note, however, that protection from “take” begins at this stage under state law.

habitats—most of which are important ecologically—than any other laws. The U.S. Environmental Protection Agency (EPA) has primary authority under the Clean Water Act to set standards for water quality and for effluents, but the U.S. Army Corps of Engineers (Corps) has responsibility for permitting dredge and fill in wetlands.

Marine Protection, Research, and Sanctuaries Act of 1972

This legislation allowed for establishment of marine sanctuaries, such as the Monterey Bay National Marine Sanctuary (established in 1992) off the coast of the San Francisco Peninsula. This part of the act provides increased protection from a variety of human influences on the marine resources within the sanctuary. Among its important uses, the Monterey Bay National Marine Sanctuary provides an essential fishery, recreational opportunities, and habitat for a myriad of rare and common shorebirds, marine mammals, and other wildlife. Section 103 of this act regulates the transportation of dredged materials in ocean waters. This act is implemented through a permit granted by the Corps, which uses the EPA's ocean disposal criteria to regulate the disposal of dredged materials.

Rivers and Harbors Act of 1899

Section 10 of the Rivers and Harbors Act prohibits the obstruction or alteration of any navigable water of the United States. Under this act, the Corps must authorize any excavation or deposition of materials into such waters, or for any work that could affect the course, location, condition, or capacity of such waters.

Coastal Zone Management Act of 1972

This act established the authority for creating coastal zone management areas and the California Coastal Commission. Coastal zone management criteria are established by the Commission and must be followed by federal, other government, or private entities performing any activities within the coastal zone.

FEDERAL AGENCIES RESPONSIBLE FOR MANAGING BIOLOGICAL RESOURCES

U.S. Fish and Wildlife Service

The mission of USFWS is to conserve, protect, and enhance the nation's fish and wildlife and their habitats for the continuing benefit of people. USFWS programs include management of wildlife sanctuaries, regulation of international and intrastate commerce related to wildlife, management of migratory species that move between states, wildlife management research, and identification and protection of endangered species.

STATE REGULATIONS

California Environmental Quality Act

The intent of the California Environmental Quality Act (CEQA) is to maintain "high-quality ecological systems and the general welfare of the people of the state." It is the policy of the state to "prevent the elimination of fish or wildlife species due to man's activities, ensure that fish and wildlife populations do not drop below self-perpetuating levels, and preserve for future

generations representations of all plant and animal communities and examples of the major periods of California history.” CEQA forbids agencies from approving projects with significant adverse impacts when feasible alternatives or feasible mitigation measures can substantially lessen such impacts.³

CEQA directs each state agency to consult with the California Department of Fish and Game (CDFG) on any project an agency initiates that is not statutorily or categorically exempt from CEQA. CEQA *Guidelines* (Section 15065a) indicate that impacts to rare, threatened, or endangered plants or animals are significant. This finding of significance can be applied directly to state- and federally listed species. Impacts to other species that may generally meet these criteria but are not officially listed may be considered significant by the lead agency (for an EIR), depending on the applicability of other laws (e.g., Migratory Bird Treaty Act) and the discretion of the agency. The CDFG interprets Lists 1A, 1B, and 2 of the California Native Plant Society’s *Inventory of Rare and Endangered Vascular Plants of California* to consist of plants that, in a majority of cases, would qualify for listing as rare, threatened, or endangered. However, the determination of whether an impact is significant is a function of the lead agency, absent the protection of other laws. Projects subject to CEQA review must specifically address the potential impact of the listed species and provide mitigation measures, if the impact is significant.

California Endangered Species Act

Under the California Endangered Species Act (CESA), the CDFG has the responsibility for maintaining a list of threatened and endangered species (California Fish and Game Code 2070). The CDFG also maintains a list of “candidate species,” which are species formally noticed as being under review for addition to either the list of endangered species or the list of threatened species. In addition, CDFG maintains lists of “species of special concern,” which serve as “watch lists.” Pursuant to the requirements of CESA, an agency reviewing a proposed project within its jurisdiction must determine whether any state-listed endangered or threatened species could be present on the project site and determine whether the proposed project could have a potentially significant impact on such species. In addition, the CDFG encourages informal consultation on any proposed project that may impact a candidate species. Project-related impacts to species on the CESA endangered or threatened lists would be considered significant in this EIR. Impacts to “species of concern” would be considered significant under certain circumstances, discussed below.

California Native Plant Protection Act

State listing of plant species began in 1977 with the passage of the California Native Plant Protection Act (NPPA), which directed the CDFG to carry out the legislature’s intent to “preserve, protect, and enhance endangered plants in this state.” The NPPA gave the California

³ CEQA also provides that a project might be approved in spite of residual, unmitigated significant impacts, by adoption of a statement of overriding social and economic considerations in situations where mitigations or alternatives are deemed infeasible.

Fish and Game Commission the power to designate native plants as endangered or rare and to require permits for collecting, transporting, or selling such plants. The California Endangered Species Act expanded upon the original NPPA and enhanced legal protection for plants. CESA established threatened and endangered species categories, and grandfathered all rare animals—but not rare plants—into the act as threatened species. Thus, there are three listing categories for plants in California: rare, threatened, and endangered.

California Coastal Act

The California Coastal Commission was established by voter initiative in 1972 (Proposition 20) and made permanent by the legislature in 1976. The mission of the Commission, as the lead agency responsible for carrying out California's coastal management program, is to plan for and regulate development in the coastal zone consistent with the policies of the California Coastal Act. The Commission is also one of two designated state coastal management agencies established for the purpose of administering the federal Coastal Zone Management Act in California. The Bay Conservation and Development Commission (BCDC) (discussed below) has authority over federal activities and federally licensed or assisted activities within San Francisco Bay, many of which are not otherwise subject to state control. The California Coastal Commission has the same authority over federal activities and federally licensed or assisted activities elsewhere in the California coastal zone. The basic goals of the state for the coastal zone are to:

- Protect, maintain, and, where feasible, enhance and restore the overall quality of the coastal zone environment and its natural and artificial resources;
- Assure orderly, balanced use and conservation of coastal zone resources, taking into account the social and economic needs of the people of the state;
- Maximize public access to and along the coast and maximize public recreational opportunities in the coastal zone consistent with sound resource conservation principles and constitutionally protected rights of private property owners;
- Assure priority for coastal-dependent and coastal-related development over other development on the coast; and
- Encourage state and local initiatives and cooperation in preparing procedures to implement coordinated planning and development for mutually beneficial uses, including educational uses, in the coastal zone.

LOCAL/REGIONAL REGULATIONS

Habitat Conservation Plans

East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan (HCP/NCCP) (2006)

The East Contra Costa County HCP/NCCP, created by Jones & Stokes in 2006 and overseen by the East Contra Costa County Habitat Conservancy, covers the eastern one-third of Contra Costa

County (174,018 acres). It allows Contra Costa County, the Contra Costa County Flood Control and Water District, the East Bay Regional Park District, and the cities of Brentwood, Clayton, Oakley, and Pittsburg to streamline environmental permitting for activities and projects in the region that are covered by the HCP. The HCP also provides for comprehensive species, wetlands, and ecosystem conservation, and contributes to the recovery of endangered species in California, while allowing for limited take of 28 listed and non-listed (“covered”) species. Specifically, the East Contra Costa County HCP proposes to provide take authorization for the following covered species: Townsend’s big-eared bat (*Corynorhinus townsendii townsendii*), San Joaquin kit fox (*Vulpes macrotus mutica*), tricolored blackbird (*Agelaius tricolor*), golden eagle (*Aquila chrysaetos*), western burrowing owl (*Athene cunicularia*), Swainson’s hawk (*Buteo swainsoni*), silvery legless lizard (*Annieta pulchra pulchra*), Alameda whipsnake (*Masticophis lateralis euryxanthus*), giant garter snake (*Thamnophis gigas*), western pond turtle (*Actinemys marmorata*), California tiger salamander (*Ambystoma californiense*), California red-legged frog (*Rana draytonii*), foothill yellow-legged frog (*Rana boylei*), longhorn fairy shrimp (*Branchinecta longiantenna*), vernal pool fairy shrimp (*Branchinecta lynchi*), midvalley fairy shrimp (*Branchinecta mesovallensis*), vernal pool tadpole shrimp (*Branchinecta lynchi*), Mount Diablo manzanita (*Arctostaphylos auriculata*), brittlescale (*Atriplex depressa*), San Joaquin spearscale (*Atriplex joaquiniana*), big tarplant (*Blepharizonia plumosa*), Mt. Diablo fairy lantern (*Calochortus pulchellus*), recurved larkspur (*Delphinium recurvatum*), round-leaved filaree (*Erodium macrophyllum*), Diablo helianthella (*Helianthella castanea*), Brewer’s dwarf flax (*Hesperolinon breweri*), showy madia (*Madia radiata*), and adobe navarretia (*Navaretia nigelliformis* ssp. *nigelliformis*). By implementing the HCP, the above-mentioned signatories will have a 30-year permit from USFWS and CDFG that authorizes take on covered species, and will avoid project-by-project permitting that is generally costly and time consuming.

The Transportation 2035 Plan ground- or habitat-disturbing transportation projects that are within the boundaries of the HCP’s *urban development area* are covered under the East Contra Costa County HCP (see *Section 2.3.1 – Activities within the Urban Development Area* of the HCP) (Jones & Stokes, 2006). Specific rural transportation projects taking place outside the urban limit line are also included as covered activities under the HCP, and are described in *Section 2.3.2 – Rural Infrastructure Projects*. Specific rural transportation projects include various road widening projects (e.g. State Route 4 widening to Discovery Bay); bridge replacement, repair, and retrofit projects; and road safety improvements. Conservation Measure 1.12 describes Best Management Practices (BMPs) for rural road maintenance activities, and Conservation Measure 1.14 describes siting, design, and construction requirements for covered roads outside the urban development area. The following road safety improvement projects are subject to the design requirements in the HCP, because they are expected to result in new ground disturbance or may create or worsen a wildlife movement barrier:

- Increasing road lane widths or adding turn lanes (but not increasing the number of lanes).
- Minor curve realignment for safety purposes (less than 250 feet long and less than 0.25 acre of new ground disturbance).
- Installing median barriers or other impermeable safety barriers.

- Constructing, resurfacing, or regarding road shoulders.

Road safety improvement projects such as traffic signal installation, painting a new lane striping, installing “rumble” strips or other safety markers, and other road safety improvements that do not result in a significant change in road width or alignment, are not subject to the design requirements described in the HCP, because they are not expected to result in new ground disturbance and are not expected to create or worsen a wildlife movement barrier.

Santa Clara Valley Habitat Conservation Plan/Natural Communities Conservation Plan – Administrative Draft (2008)

The City of San Jose, Santa Clara County, Santa Clara Valley Transportation Authority, Santa Clara Valley Water District, City of Gilroy, and City of Morgan Hill have initiated a collaborative process to prepare and implement an HCP/NCCP for the Santa Clara Valley. The Administrative Draft of this HCP was completed in August 2008, and targets specific areas of the county where land development activities and the continued survival of endangered, threatened, or other species of concern are in conflict. The goal of this Plan is to provide the means for conservation of these species, thereby contributing to their recovery while allowing for compatible and appropriate development to occur. The HCP and associated environmental documentation are scheduled for completion in 2009 (ICF Jones & Stokes, 2008).

Section 2.3.2 of this HCP describes covered transportation facilities within urban areas, including sidewalks, bike paths, paved and unpaved roads, bridges, culverts, and transit facilities; and Section 2.3.5 describes specific rural transportation projects that are covered by the HCP, and that provide infrastructure to support existing urban development and urban development planned (ICF Jones & Stokes, 2008). These transportation projects are covered under several Conditions in Chapter 6 of the Santa Clara Valley HCP, including: Condition 2 - Urban-Wildland Interface Design Requirements; Condition 4 – Stream Avoidance and Minimization for In-Stream Projects; Condition 5 – Best Management Practices for In-Stream Operations and Management; Condition 6 – Design and Construction Requirements for Covered Transportation Projects (this Condition excludes those projects that are outside streams, or within the Urban Service Area as defined in the HCP); Condition 8 – Best Management Practices for Rural Road Maintenance (ICF Jones & Stokes, 2008).

Conservation Strategy

Santa Rosa Plain Conservation Strategy (2005)

The Santa Rosa Plain Conservation Strategy seeks to create a long-term program to mitigate potential adverse effects on listed species due to future development on the Santa Rosa Plain, which is located in central Sonoma County, bordered on the south and west by the Laguna de Santa Rosa, on the east by the foothills, and on the north by the Russian River. The Plain and adjacent areas are characterized by vernal pools, seasonal wetlands, and associated grassland habitat, which supports several species of flora and fauna that are listed by the FESA as threatened or endangered, including the federally threatened California tiger salamander (CTS) and four federally endangered plant species - Burke’s goldfields (*Lasthenia burkei*), Sonoma

sunshine (*Blennosperma bakeri*), Sebastapol meadowfoam (*Limnanthes vincularis*), and many-flowered navarretia (*Navarretia leucocephala* ssp. *plieantha*).

The Conservation Strategy was created to (1) provide a plan for local agencies, developers, and community groups that would preserve and enhance populations and habitat of the listed species; (2) support the issuance of a USFWS authorization for incidental take of CTS and listed plants that may occur in the course of carrying out a broad range of activities on the Plain; and (3) protect stakeholder's (public and private) interests. It is based in part on CH2M Hill's Santa Rosa Plain Vernal Pool Ecosystem Preservation Plan (1995).

The Conservation Strategy addresses various aspects of urban and rural growth and its effects on the above-listed species, mitigation for impacts to these listed species and wetlands, and the conservation and recovery of the listed species and their habitat. The Conservation Strategy identified the Southwest Santa Rosa Preserve System and nine "Conservation Areas" through the Plain, where mitigation for project-related impacts to listed species and vernal pools should be directed. The designation of Conservation Areas is based on the following factors: (1) known distribution of CTS; (2) presence of suitable CTS habitat; (3) presence of large blocks of natural or restorable land; (4) adjacency to existing preserves; and (5) known location of the listed plants. A critical component of the Conservation Strategy is that 350-900 acres of actual preserve land ultimately will be established within each Conservation Area.

As of September 2008 the Conservation Strategy had not yet been adopted. However, the USFWS Programmatic Biological Opinion (2007) can still be invoked for projects that have suitable habitat for CTS, Burke's goldfields, Sonoma sunshine, Sebastapol meadowfoam, and many-flowered navarretia, and that impact wetlands in the Santa Rosa Plain.

Bay Conservation and Development Commission Acts and Plans

Suisun Marsh Preservation Act of 1977 and Suisun Marsh Protection Plan

The *Nejedly-Bagley-Z'berg Suisun Marsh Act* was enacted in 1974 to require the San Francisco BCDC and the CDFG to prepare a plan (later called the *Suisun Marsh Protection Plan*) to preserve the integrity and assure continued wildlife use of the Suisun Marsh, approximately 85,000 acres of tidal marsh, managed wetlands, and waterways in southern Solano County, which is the largest remaining brackish wetland complex in San Francisco Bay, more than ten percent of California's remaining wetland area, and a wildlife habitat of international importance. The Suisun Marsh Preservation Act (Cal. Pub. Res. Code Sections 29000–29612) was enacted in 1977 to incorporate the findings and policies contained in the *Suisun Marsh Protection Plan* of 1976 into state law, and to empower BCDC to implement the plan through its regulatory authority.

The Suisun Marsh Protection Plan, in brief, proposes (1) a primary management area encompassing the 89,000 acres of tidal marsh, managed wetlands, adjacent grasslands, and waterways over most of which BCDC now has jurisdiction, and (2) a secondary management area of approximately 22,500 acres of significant buffer lands. Under specific guidelines in each area, Solano County would be responsible for preparing and administering a local protection program. BCDC would represent the state's interest, serving as the land use permitting agency for major

projects in the primary management area, and as an appellate body with limited functions in the secondary management area.

The San Francisco Bay Plan

The San Francisco Bay Plan (Bay Plan) was developed by the BCDC in 1968, and its provisions are currently maintained and carried out by the BCDC. The Bay Plan provides the findings and policies to guide future uses of the Bay and shoreline, certain waterways, salt ponds and managed wetlands, and the maps that apply these policies to the BCDC's jurisdiction. The Bay Plan lists several policies that are relevant to transportation, and the RTP (BCDC, 2005):

- Because of the continuing vulnerability of the Bay to filling for transportation projects, the Commission should continue to take an active role in Bay Area regional transportation and related land use planning affecting the Bay, particularly to encourage alternative methods of transportation and land use planning efforts that support transit and that do not require fill. The Metropolitan Transportation Commission, the California Department of Transportation, the California Transportation Commission, the Federal Highway Administration, county congestion management agencies and other public and private transportation authorities should avoid planning or funding roads that would require fill in the Bay and certain waterways.
- If any additional bridge is proposed across the Bay, adequate research and testing should determine whether feasible alternative route, transportation mode or operational improvement could overcome the particular congestion problem without placing an additional route in the Bay and, if not, whether a tunnel beneath the Bay is a feasible alternative.
- If a route must be located across the Bay or a certain waterway, the following provisions should apply:
 1. The crossing should be placed on a bridge or in a tunnel, not on solid fill.
 2. Bridges should provide adequate clearance for vessels that normally navigate the waterway beneath the bridge.
 3. Toll plazas, service yards, or similar facilities should not be located on new fill and should be located far enough from the Bay shoreline to provide adequate space for maximum feasible public access along the shoreline.
 4. To reduce the need for future Bay crossings, any new Bay crossing should be designed to move the largest number of travelers possible by employing technology and operations that increase the efficiency and capacity of the infrastructure, accommodating non-motorized transportation and, where feasible, providing public transit facilities.
- Transportation projects on the Bay shoreline and bridges over the Bay or certain waterways should include pedestrian and bicycle paths that will either be a part of the Bay Trail or connect the Bay Trail with other regional and community trails. Transportation projects

should be designed to maintain and enhance visual and physical access to the Bay and along the Bay shoreline.

- Ferry terminals should be sited at locations that are near navigable channels, would not rapidly fill with sediment and would not significantly impact tidal marshes, tidal flats or other valuable wildlife habitat. Wherever possible, terminals should be located near higher density, mixed-use development served by public transit. Terminal parking facilities should be set back from the shoreline to allow for public access and enjoyment of the Bay.

STATE AGENCIES RESPONSIBLE FOR MANAGING BIOLOGICAL RESOURCES

California Department of Fish and Game

The mandate of CDFG is to manage California's diverse fish, wildlife, and plant resources, and the habitats upon which they depend, for their ecological values and for their use and enjoyment by the public. In particular, CDFG is required under CESA, NEPA, CEQA, and the Natural Community Conservation Planning Act to conserve species through listing, habitat acquisition and protection, review of local land use planning, multi-species conservation planning, stewardship, recovery, research, and education.

California Coastal Commission

The coastal zone generally extends three miles seaward and about 1,000 yards inland. In particularly important and generally undeveloped areas where there can be considerable impact on the coastline from inland development, the coastal zone extends to a maximum of five miles inland from the mean high-tide line. In developed urban areas, the coastal zone extends substantially less than 1,000 yards inland. In order to carry out the policies of the Coastal Act, each of the 73 cities and counties in the coastal zone is required to prepare a local coastal program for the portion of its jurisdiction within the coastal zone and to submit the program to the Commission for certification. California Coastal Commission offices serving the Bay Area and central coast are located in San Francisco and Santa Cruz, respectively.

The California Coastal Commission manages protection of biological resources through a permitting process for all projects in the coastal zone. The Coastal Commission has unusually broad authority to regulate development in the coastal zone, and a permit is required for any project that might change the intensity of land use in the coastal zone. For example, a project that would require a building or grading permit from a city or county would also require a permit from the Coastal Commission. Other projects, such as major vegetation clearing or subdividing, would require a permit from the Commission. The Coastal Commission reviews applications before it to determine whether the project would substantially change any existing biological resources, including biodiversity, and to consider the net effects of the project on rare and endangered species.

Bay Conservation and Development Commission

The San Francisco Bay Conservation and Development Commission (BCDC) was created by the California Legislature in 1965 by the McAteer-Petris Act, in response to public concern over the future of the San Francisco Bay. BCDC regulates filling and dredging in the San Francisco Bay

Appendix D: Biological Resources

including San Pablo Bay, Suisun Bay and sloughs, and certain creeks and tributaries that are part of the Bay system, as well as a 100-foot-wide coastline immediately bordering the Bay. Specifically, BCDC's responsibilities include: (1) regulating filling and dredging in the San Francisco Bay; (2) regulating new development within the first 100 feet inland from the Bay shoreline to ensure that maximum feasible public access to the Bay is provided; (3) protecting the Suisun Marsh; (4) ensuring that the limited amount of shoreline area suitable for high priority water-oriented uses is reserved for ports, water-related industries, water-oriented recreation, airports and wildlife refuges; (5) pursuing an active planning program to study Bay issues so that Commission plans and policies are based upon the best available current information; (5) administering the federal Coastal Zone Management Act within the San Francisco Bay segment of the California coastal zone to ensure that federal activities reflect Commission policies; (6) participating in the regionwide state and federal Long-Term Management Strategy for dredging and dredge material disposal in the San Francisco Bay; and (7) participating in California's oil spill prevention and response program.

California Department of Parks and Recreation

The California Department of Parks and Recreation provides sites for a variety of recreational and outdoor activities. Natural resource management and protection is also a part of the mission of Department. Park designations such as *natural preserve*, *state park*, *state reserve*, and *state wilderness* indicate that the area has outstanding natural features. By contrast, a designated *state historic preserve*, *state recreation area*, *state beach*, and *state vehicular recreation area* indicates the state has placed a higher priority on historic or recreational activities, although they may contain areas designated and protected for their natural features. State parks adjacent to transportation corridors include Olompali State Park in Marin County, Candlestick Point SRA in San Francisco County, and the Eastshore State Park between the Bay Bridge in Oakland to Marina Bay in Richmond in Alameda and Contra Costa Counties.

BIOLOGICAL RESOURCES PROTECTED BY STATUTE AND POLICY

Special-Status Natural Communities

Special-status natural communities are identified as such by CDFG Natural Heritage Division. These communities include those that are both naturally rare and those that have been greatly diminished through changes in land use. The CDFG tracks 135 such natural communities in the same way that it tracks occurrences of special-status species: information is maintained on each site in terms of its location, extent, habitat quality, level of disturbance, and current protection measures. The CDFG is mandated to seek the long-term perpetuation of the areas in which these communities occur. In some cases, these areas have been established as protected reserves. There is no statewide law that requires protection of all special-status natural communities, but CEQA requires consideration of the potential impacts of a project to biological resources of statewide or regional significance.

Special-Status Plant and Wildlife Species

A number of species known to occur in the Bay Area are accorded "special-status" because of their recognized rarity or vulnerability to habitat loss or population decline. Some of these species are listed and receive specific protection defined in federal or state endangered species legislation.

Other species have not been formally listed as threatened or endangered, but have been designated as “rare” or “sensitive” on the basis of adopted policies and expertise of state resource agencies or organizations with acknowledged expertise, or policies adopted by local governmental agencies such as counties, cities, and special districts to meet local conservation objectives. These species are referred to collectively as “special-status species” following a convention that has developed in practice but has no official sanction. Special-status species in the Bay Area are subject to the following:

- The California Native Plant Protection Act (California Fish and Game Code 1900 et seq.) protects endangered and “rare” species, subspecies, and varieties of plants.
- The California Endangered Species Act lists plants and wildlife as threatened or endangered (California Fish and Game Code 2070).
- The Federal Endangered Species Act (FESA), the Secretary of Commerce, and the Secretary of the Interior list plants and wildlife as threatened or endangered (16 USC 1533[a]; 16 USC 1533[a] [2]; 16 USC 1533 [c] [1]).
- The California Environmental Quality Act (CEQA), *Guidelines* Section 15380 includes plants and wildlife that may be considered rare or endangered if the species meets certain specified criteria.
- The California Native Plant Society designates rare, threatened, or endangered plants as List 1 and List 2, and plants about which more information is needed and plants with limited distributions as List 3 and List 4.
- The California Department of Fish and Game (CDFG) designates plants and wildlife as “species of special concern” and protects the destruction of nests and eggs of any bird (Section 3503).
- The federal Bald Eagle Protection Act prohibits persons within the United States (or places subject to U.S. jurisdiction) from “possessing, selling, purchasing, offering to sell, transporting, exporting or importing any bald eagle or any golden eagle, alive or dead, or any part, nest, or egg thereof.”
- The Migratory Bird Treaty Act (16 USC, Section 703, Supplement I, 1989) prohibits killing, possessing, or trading of migratory non-game birds.
- The California Fish and Game Code (Section 3503.5, 1992) protects birds of prey from unlawful take, possession, or destruction of any birds in the order Falconiformes or Strigiformes (birds of prey) and prohibits the possession or destruction of the nests or eggs of any such bird.
- The California Fish and Game Code (Section 3511 [birds], Section 5050 [reptiles and amphibians], and Section 4700 [mammals]) designates certain wildlife species as fully protected in California.

Protected Plant and Wildlife Areas

CDFG protects rare, threatened, and endangered species by managing habitat in legally designated ecological reserves or wildlife areas. Several of these reserves are located in the Bay Area. Likewise, the USFWS maintains the National Wildlife Refuge system that includes units in the Bay Area. Additional tracts of open space in the Bay Area, supporting valuable wildlife resources, are administered by other federal and state agencies, including the National Park Service and California Department of Parks and Recreation.

The counties and many cities in the Bay Area have established major parklands that sustain important wildlife resources. There are other quasi- and non-governmental organizations that oversee the management and protection of critical plant and wildlife communities, including the East Bay Regional Park District, San Francisco Public Utilities Commission, National Audubon Society, and The Nature Conservancy.

Wetlands

Wetlands are ecologically productive habitats that support a rich variety of both plant and animal life. The importance and sensitivity of wetlands has increased with the recognition of their value as recharge areas and filters for water supplies. In a jurisdictional sense, there are two definitions of a wetland, one definition adopted by federal agencies and a separate definition adopted by the State of California. Both definitions are presented below.

Within California, approximately 95 percent of the state's historic wetlands have been converted to other land uses. An estimated 5 million acres of wetlands were present in California in the 1780s; by the 1980s, the acreage of wetlands in California had been reduced to only 450,000 acres. The loss of wetlands has been pronounced in the Bay Area and Bay Area because of the intense diking of shoreline wetlands in the Delta for agriculture as well as for salt production throughout San Francisco Bay, and as a result of hydraulic mining operations in the mid-1800s that lasted until at least the late 1800s.

Federal Wetland Definition

Wetlands are a subset of waters of the United States and receive protection under Section 404 of the Clean Water Act. The term "waters of the United States" as defined in the Code of Federal Regulations (33 CFR 328.3[a]; 40 CFR 230.3[s]) includes:

1. All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide.
2. All interstate waters including interstate wetlands. (Wetlands are defined by the federal government [CFR, Section 328.3(b), 1991] as those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.)

3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce, including any such waters that are or could be used by interstate or foreign travelers for recreational or other purposes; or from which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or which are used or could be used for industrial purposes by industries in interstate commerce.
4. All impoundments of waters otherwise defined as waters of the United States under the definition.
5. Tributaries of waters identified in paragraphs (1) through (4).
6. Territorial seas.
7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (1) through (6).

Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA [328.3(a)(8) added 58 CFR 45035, August 25, 1993].

The regulations and policies of various federal agencies (e.g., the Corps, U.S. Department of Agriculture [USDA], NRCS (Natural Resources Conservation Service), EPA, USFWS, National Marine Fisheries Service) mandate that the filling of wetlands be avoided to the extent possible. The Corps has primary federal responsibility for administering regulations that concern wetlands within the area. The Corps acts under the authority of the Clean Water Act (Section 404), which governs specified activities in "waters of the United States," including wetlands.

California Wetland Definition

Unlike the federal government, the CDFG has adopted the Cowardin et al. (1979) definition of wetlands:

Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface of the land or is covered by shallow water. For purposes of this classification, wetlands must have one or more of the following three attributes: (1) at least periodically, the land supports predominantly hydrophytes (at least 50% of the aerial vegetative cover); (2) the substrate is predominantly undrained hydric soil; and (3) the substrate is nonsoil and is saturated with water or covered by shallow water at some time during the growing season of each year.

Under normal circumstances, the federal definition of wetlands requires all three wetland identification parameters to be met, whereas the Cowardin definition requires the presence of at least one of these parameters. For this reason, identification of wetlands by CDFG consists of the union of all areas that are periodically inundated or saturated, or in which at least seasonal

dominance by hydrophytes may be documented, or in which hydric soils are present. The CDFG does not normally have direct jurisdiction over wetlands unless they are subject to jurisdiction under Streambed Alteration Agreements or they support state-listed endangered species.

Regulation of Activities in Wetlands

The regulations and policies of various federal agencies (e.g., Corps, USDA, NRCS, EPA, USFWS, NMFS) mandate that the filling of wetlands be avoided unless it can be demonstrated that no practicable alternatives exist. The Corps has primary federal responsibility for administering regulations that concern waters and wetlands in the Bay Area. In this regard, the Corps acts under two statutory authorities, the Rivers and Harbors Act (Sections 9 and 10), which governs specified activities in “navigable waters,” and the Clean Water Act (Section 404), which governs specified activities in waters of the United States, including wetlands. The Corps requires that a permit be obtained if a project proposes placing structures within navigable waters and/or alteration of waters of the U.S. below the ordinary high-water mark in nontidal waters. On agricultural lands, NRCS becomes the primary agency charged with determining the boundary of jurisdictional wetlands for implementation of the Food Securities Act, while the Corps retains primary permitting authority. EPA, USFWS, NMFS, and several other agencies provide comment on Corps permit applications. The EPA provides the primary criteria for evaluating the biological impacts of Corps permit actions in wetlands.

The state’s authority in regulating activities in wetlands and “waters” at the site resides primarily with the CDFG and the State Water Resources Control Board (SWRCB). In addition, the California Coastal Commission has review authority for wetland permits within its planning jurisdiction. The CDFG provides comment on Corps permit actions under the Fish and Wildlife Coordination Act. CDFG is also authorized under the California Fish and Game Code, Sections 1600-1607, to develop mitigation measures and enter into a Streambed Alteration Agreement with applicants that propose a project that would obstruct the flow or alter the bed, channel, or bank of a river or stream in which there is a fish or wildlife resource, including intermittent and ephemeral streams. The SWRCB, acting through the nine Regional Water Quality Control Boards, must certify that a Corps permit action meets state water quality objectives (Section 401, Clean Water Act).

Generally, the Corps and the California Coastal Commission define wetlands by using three categories: vegetation, soil, and hydrology. The Corps definition of wetlands generally requires that criteria based on all three categories be found for an area to be designated as a jurisdictional wetland. The Coastal Commission method, as defined by the California Coastal Act, specifies that an area may be delineated as a wetland based on one or more of these criteria.

In planning federal transportation projects, the MTC will consider environmental impacts to waters of the U.S. and associated sensitive species. A high priority is placed on the avoidance of adverse impacts to waters of the U.S. and associated sensitive species (including threatened and endangered species). Unavoidable impacts will be mitigated to the extent reasonable and practical.

Wetlands Stewardship

Many programs and policies have been adopted by federal, state, and regional agencies and by private entities to protect and restore wetlands in California. In 1993, a California Wetlands Conservation Policy was established. The goals of the policy were to establish a framework and a strategy that would:

- Ensure no overall net loss and achieve a long-term net gain in the quantity, quality, and permanence of wetlands acreage and values in California in a manner that fosters creativity, stewardship, and respect for private property;
- Reduce procedural complexity in the administration of state and federal wetlands conservation programs; and
- Encourage partnerships to make landowner incentive programs and cooperative planning efforts the primary focus of wetlands conservation and restoration.

The policy recommended completion of a statewide inventory of wetlands that would lead to the establishment of a formal wetland acreage goal. This inventory is in progress.

SPECIAL STATUS SPECIES LIST

Table D-1: Focused List of Special-Status Species with Potential to Occur in or Near Proposed Transportation 2035 Plan Improvements

Common Name	Listing Status USFWS/CDFG/ CNPS	General Habitat
Scientific Name		
SPECIES LISTED AS THREATENED OR ENDANGERED		
Invertebrates		
Vernal pool fairy shrimp <i>Branchinecta lynchi</i>	FT/-- Critical Habitat	Grassland vernal pools.
San Bruno elfin butterfly <i>Callophrys mossii bayensis</i>	FE/--	Coastal scrub.
Valley elderberry longhorn beetle <i>Desmocerus californicus dimorphus</i>	FT/--	Dependent on elderberry bushes, which may occur individually or associated with riparian habitats.
Bay checkerspot butterfly <i>Euphydryas editha bayensis</i>	FT/-- Critical Habitat	Serpentine bunchgrass grassland.
Mission blue butterfly <i>Plebejus icarioides missionensis</i>	FE/--	Grassland with <i>Lupinus albifrons</i> , <i>L. formosa</i> , and <i>L. varicolor</i> .
Callippe silverspot butterfly <i>Speyeria callippe callippe</i>	FE/--	Native grasslands with <i>Viola pedunculata</i> as larval food plant.
Myrtle silverspot butterfly <i>Speyeria zerene myrtleae</i>	FE/--	Native grasslands with <i>Viola pedunculata</i> as larval food plant.
California freshwater shrimp <i>Syncaris pacifica</i>	FE/CE	Large, slow-moving freshwater streams in Sonoma and Napa Counties.
Fish		
Tidewater goby <i>Eucyclogobius newberryi</i>	FE/CSC	Shallow waters of bays and estuaries.
Delta smelt <i>Hypomesus transpacificus</i>	FT/CT Critical Habitat	Brackish-water channels and sloughs of the Sacramento – San Joaquin Delta.
Coho salmon – central California ESU <i>Oncorhynchus kisutch</i>	FE/CE	Unblocked Bay Area and coastal rivers and streams; particularly cooler water streams in Marin, Sonoma, and Napa Counties, and the Sacramento – San Joaquin Delta.
Central California coast steelhead <i>Oncorhynchus mykiss</i>	FT/CSC Critical Habitat	Drainages of central California coastal rivers.
Central coast Chinook salmon <i>Oncorhynchus tshawytscha</i>	FT/CSC Critical Habitat	Drainages of central California coastal rivers.

Table D-1: Focused List of Special-Status Species with Potential to Occur in or Near Proposed Transportation 2035 Plan Improvements

Common Name Scientific Name	Listing Status USFWS/CDFG/ CNPS	General Habitat
SPECIES LISTED AS THREATENED OR ENDANGERED		
Amphibians		
California tiger salamander <i>Ambystoma californiense</i>	FT/CSC Critical Habitat	Wintering sites occur in grasslands occupied by burrowing mammals; breed in ponds, vernal pools, and slow-moving or receding streams.
California red-legged frog <i>Rana draytonii</i>	FT/CSC Critical Habitat	Breed in stock ponds, pools, and slow-moving streams with emergent vegetation; adjacent upland habitats are often used outside the breeding season.
Reptiles		
Alameda whipsnake <i>Masticophis lateralis euryxanthus</i>	FT/CT Critical Habitat	Coastal scrub of the East Bay Hills broken by scattered grassy patches, on rocky hillsides, gullies, or canyons with stream courses.
Giant garter snake <i>Thamnophis gigas</i>	FT/CT	Typically found in Central Valley wetlands, this species requires permanent or semi permanent water and dense vegetation of freshwater marshes and permanent streams. May also use drainage canals and irrigation ditches that hold water through most of the year.
San Francisco garter snake <i>Thamnophis sirtalis tetrataenia</i>	FE/CE	Freshwater ponds and slow streams with emergent vegetation; nearby upland grasslands with small rodent burrows may also provide habitat for this species. Little is known about the seasonal movements of this species or its capacity for using upland areas.
Birds		
Marbled murrelet <i>Brachyramphus marmoratus</i>	FT/CE Critical Habitat	Nests in dense, old-growth forests along coast.
Swainson's hawk <i>Buteo swainsoni</i>	--/CT	Nests in oaks or cottonwoods in or near riparian habitat. Forages in grasslands and agricultural fields.
Western snowy plover <i>Charadrius alexandrinus nivosus</i>	FT/CSC Critical Habitat	Nests and forages on sandy beaches on marine and estuarine shores; requires sandy, gravelly, or friable soils for nesting; may nest on salt pond levees or other suitable barren habitat.
American peregrine falcon <i>Falco peregrinus anatum</i>	--/CE	Forages in marshes and grasslands. Nesting habitat includes high, protected cliffs and ledges near water.
California black rail <i>Laterallus jamaicensis coturniculus</i>	FSC/CT	Nests and forages in tidal emergent wetland with pickleweed.
California clapper rail <i>Rallus longirostris obsoletus</i>	FE/CE	Nests and forages in emergent wetlands with pickleweed, cordgrass, and bulrush.

Appendices

Appendix D: Biological Resources

Table D-1: Focused List of Special-Status Species with Potential to Occur in or Near Proposed Transportation 2035 Plan Improvements

Common Name Scientific Name	Listing Status USFWS/CDFG/ CNPS	General Habitat
SPECIES LISTED AS THREATENED OR ENDANGERED		
Birds		
California least tern <i>Sterna antillarum browni</i>	FE/CE	Nests along the coast from San Francisco Bay south to northern Baja California; colonial breeder on bare or sparsely vegetated flat substrates including sand beaches, alkali flats, landfills, or paved areas.
Northern spotted owl <i>Strix occidentalis caurina</i>	FT/-- Critical Habitat	Nest in large tree in old-growth or mature forests.
Mammals		
Salt marsh harvest mouse <i>Reithrodontomys raviventris raviventris</i>	FE/CE	Saline emergent marshlands with dense pickleweed.
San Joaquin kit fox <i>Vulpes macrotis mutica</i>	FE/CT	Patchily distributed in the Diablo Range and south to Bakersfield in undeveloped grasslands and agricultural land.
Plants		
Large-flowered fiddleneck <i>Amsinckia grandiflora</i>	FE/CE/IB.1	Valley grassland and foothill woodland, this species has been reported from Contra Costa County, Alameda, and Santa Clara Counties.
San Bruno Mtn. manzanita <i>Arctostaphylos imbricata</i>	FSC/CE/IB.1	Chaparral, coastal scrub.
Pacific manzanita <i>Arctostaphylos pacifica</i>	FSC/CE/IB.2	Chaparral, coastal scrub.
Pallid manzanita <i>Arctostaphylos pallida</i>	FT/CE/IB.1	Chaparral habitats in Alameda and Contra Costa Counties.
Tiburon Indian paintbrush <i>Castilleja affinis</i> ssp. <i>neglecta</i>	FE/CT/IB.2	Dry slopes in the Coast Ranges from San Mateo to Sonoma Counties.
Coyote ceanothus <i>Ceanothus ferrisiae</i>	FE/--/IB.1	Dry serpentine slopes in foothill woodlands and chaparral habitats in the Santa Cruz Mountains.
Robust spineflower <i>Chorizanthe robusta</i> var. <i>robusta</i>	FE/--/IB.1	Coastal scrub, coastal sand dunes, openings in oak woodlands with sandy or gravelly soil.
Crystal Springs fountain thistle <i>Cirsium fontinale</i> var. <i>fontinale</i>	FE/CE/IB.1	Grassland and openings in chaparral, in serpentinite seeps.
Suisun thistle <i>Cirsium hydrophilum</i> var. <i>hydrophilum</i>	FE/CE/IB.1	Brackish marshes around Suisun Bay.
Presidio clarkia <i>Clarkia franciscana</i>	FE/CE/IB.1	Coastal scrub, grassland (ultramafic).
Soft bird's beak <i>Cordylanthus mollis</i> ssp. <i>mollis</i>	FE/CR/IB.2	Heavy clay soils of either coastal salt or brackish marshes of northern San Francisco Bay.

Table D-1: Focused List of Special-Status Species with Potential to Occur in or Near Proposed Transportation 2035 Plan Improvements

Common Name	Listing Status	
Scientific Name	USFWS/CDFG/ CNPS	General Habitat
SPECIES LISTED AS THREATENED OR ENDANGERED		
Plants		
Yellow larkspur <i>Delphinium luteum</i>	FE/CR/IB.I Critical Habitat	Sea bluffs and northern coastal scrub.
Santa Clara Valley dudleya <i>Dudleya setchellii</i>	FE/--/IB.I	Ultramafic grasslands.
San Mateo woolly sunflower <i>Eriophyllum latilobum</i>	FE/CE/IB.I	Grassland, woodland slopes.
Contra Costa wallflower <i>Erysimum capitatum</i> ssp. <i>angustatum</i>	FE/CE/IB.I	Antioch Dunes along the San Joaquin River; Contra Costa County.
San Mateo woolly sunflower <i>Eriophyllum latilobum</i>	FE/CE/IB.I	Grassland, woodland slopes.
Contra Costa wallflower <i>Erysimum capitatum</i> ssp. <i>angustatum</i>	FE/CE/IB.I	Antioch Dunes along the San Joaquin River; Contra Costa County.
Marin western flax <i>Hesperolinon congestum</i>	FT/CT/IB.I	Grassland and openings in chaparral, often on serpentinite.
Santa Cruz tarplant <i>Holocarpha macradenia</i>	FT/CE/IB.I	Coastal scrub, coastal sand dunes, openings in oak woodlands with sandy or gravelly soil.
Contra Costa goldfields <i>Lasthenia conjugens</i>	FE/--/IB.I Critical Habitat	Moist grasslands, vernal pools.
White-rayed pentachaeta <i>Pentachaeta bellidiflora</i>	FE/CE/IB.I	Coastal scrub, grassland.
San Francisco popcorn flower <i>Plagiobothrys diffusus</i>	FSC/CE/IB.I	Grasslands with marine influence.
Metcalf Canyon jewel flower <i>Streptanthus albidus</i> ssp. <i>albidus</i>	FE/--/IB.I	Serpentine outcrops in chaparral habitats.
Tiburon jewel-flower <i>Streptanthus niger</i>	FE/CE/IB.I	Serpentine slopes among coastal prairie habitat; Marin County.
Solano grass <i>Tuctoria mucronata</i>	FE/CE/IB.I	Vernal pools in valley grassland habitats; Solano County.

Appendix D: Biological Resources

Table F-1: Focused List of Special-Status Species with Potential to Occur in or Near Proposed Transportation 2035 Plan Improvements

Common Name	Listing Status USFWS/CDFG/ CNPS	General Habitat
OTHER SPECIES OF SPECIAL CONCERN		
Invertebrates		
Opler's longhorn moth <i>Adella oplerella</i>	FSC/--	Serpentine grasslands.
Edgewood Park blind harvestman <i>Calicina minor</i>	FSC/--	Described from beneath rocks in serpentine grassland adjacent to scrub oaks.
Serpentine phalangid <i>Calcina serpentina</i>	FSC/--	Serpentine rocks and barrens.
Monarch butterfly <i>Danaus plexippus</i>	--/*	Eucalyptus groves (winter sites).
Bridge's coast range shoulderband snail <i>Helminthoglypta nickliniana bridgesi</i>	FSC/--	Coastal scrub habitat and weedy pastures.
Ricksecker's water scavenger beetle <i>Hydrochara rickseckeri</i>	FSC/--	Freshwater ponds, shallow water of streams, marshes, and lakes.
Leech's skyline diving beetle <i>Hydroporus leechi</i>	FSC/--	Freshwater ponds, shallow water of streams, marshes, and lakes.
Curved-foot hygrotus diving beetle <i>Hygrotus curvipes</i>	FSC/--	Vernal pools and alkali flats.
San Francisco fork-tailed damselfly <i>Ischnura gemina</i>	FSC/--	Wetlands with emergent vegetation.
Tiburon micro-blind harvestman <i>Microcina tiburona</i>	FSC/--	Undersides of serpentine rocks near permanent springs; restricted to the Tiburon peninsula.
San Francisco lacewing <i>Nothochrysa californica</i>	FSC/--	Grasslands.
Unsilvered fritillary butterfly <i>Speyeria adaste adaste</i>	FSC/--	Native grasslands with <i>Viola pedunculata</i> as larval food plant.
Fish		
Sacramento perch <i>Archoplites interruptus</i>	FSC/CSC	Slow-moving sloughs, streams, rivers, and lakes.
River lamprey <i>Lampetra ayresi</i>	FSC/CSC	Pacific Ocean and estuaries; spawning in coastal streams from Alaska to San Francisco Bay.
Pacific lamprey <i>Lampetra tridentata</i>	FSC/--	Adults inhabit estuaries and nearby ocean areas with spawning in upstream gravel beds. Larvae remain buried throughout most of their 5- to 7-year larval life and then move to downstream estuarine stream reaches.

Table F-1: Focused List of Special-Status Species with Potential to Occur in or Near Proposed Transportation 2035 Plan Improvements

Common Name Scientific Name	Listing Status USFWS/CDFG/ CNPS	General Habitat
OTHER SPECIES OF SPECIAL CONCERN		
Sacramento splittail <i>Pogonichthys macrolepidotus</i>	--/CSC	Large sloughs and dead-end sloughs of the Sacramento – San Joaquin Delta that are fed by freshwater streams. Juveniles and adults utilize shallow edgewater areas lined by emergent aquatic vegetation.
Longfin smelt <i>Spirinichus thaleichthys</i>	FSC/CSC	Sacramento – San Joaquin Delta, this anadromous fish ascends rivers in cooler months to spawn.
Amphibians		
Foothill yellow-legged frog <i>Rana boylei</i>	FSC/CSC	Streams with quiet pools absent of predatory fish.
Western spadefoot <i>Spea (=Scaphiopus) hammondi</i>	FSC/CSC	Floodplains and grassland pools.
Reptiles		
Western pond turtle <i>Actinemys marmorata</i>	FSC/CSC	Freshwater ponds and slow streams edged with sandy soils for laying eggs.
San Joaquin coachwhip <i>Masticophis flagellum ruddocki</i>	FSC/CSC	Prairie, scrublands, woodlands, farmlands, or grasslands with varying amounts of cover.
California horned lizard <i>Phrynosoma coronatum frontale</i>	FSC/CSC	Patchy open areas with sandy soils and available ant food sources.
Birds		
Cooper's hawk <i>Accipiter cooperii</i>	CDFG 3503.5, WL	Nests in riparian growths of deciduous trees and live oak woodlands.
Sharp-shinned hawk <i>Accipiter striatus</i>	CDFG 3503.5	Nests in riparian growths of deciduous trees and live oaks.
Tricolored blackbird <i>Agelaius tricolor</i>	FSC/CSC	Nests in freshwater marshes with dense stands of cattails or bulrushes, occasionally in willows, thistles, mustard, blackberry brambles, and dense shrubs and grains.
Golden eagle <i>Aquila chrysaetos</i>	--/CSC	Nests in mountainous or hilly terrain and hunts over open grasslands habitats; common in Diablo Range.
Great egret <i>Ardea alba</i>	--/*	Nest colonially in groves of trees. Rookery sites located near marshes, tide-flats, irrigated pastures, and margins of rivers and lakes.
Great blue heron <i>Ardea herodias</i>	--/*	Nests in trees along lakes and estuaries.
Burrowing owl <i>Athene cunicularia</i>	FSC/CSC	Nests and forages in low-growing grasslands that support burrowing mammals.
Northern harrier <i>Circus cyaneus</i>	--/CSC	Nests in coastal freshwater and saltwater marshes, nest and forages in grasslands.

Table F-1: Focused List of Special-Status Species with Potential to Occur in or Near Proposed Transportation 2035 Plan Improvements

Common Name Scientific Name	Listing Status USFWS/CDFG/ CNPS	General Habitat
OTHER SPECIES OF SPECIAL CONCERN		
Yellow warbler <i>Dendroica petechia brewsteri</i>	--/CSC	Nests near wet habitats, particularly in willow and alder groves.
White-tailed kite (nesting) <i>Elanus leucurus</i>	CDFG fully protected	Nests near wet meadows and open grasslands, dense oak, willow, or other large tree stands.
California horned lark <i>Eremophila alpestris</i>	--/CSC	Nests and forages in barren dirt areas, shores, and gravel areas.
Birds		
Saltmarsh common yellowthroat <i>Geothlypis trichas sinuosa</i>	FSC/CSC	Breeds in moist salt marsh habitats with dense, low cover.
Yellow-breasted chat <i>Icteria virens</i>	--/CSC	Breeds in woodland edges and neglected pastures in thick willow habitats or shrubby wet meadows.
Loggerhead shrike <i>Lanius ludovicianus</i>	FSC/CSC	Scrub, open woodlands, and grasslands.
Suisun song sparrow <i>Melospiza melodia maxillaris</i>	FSC/CSC	Year-round inhabitant of saline emergent wetlands in Suisun Bay, northern San Francisco Bay, and San Pablo Bay.
Alameda song sparrow <i>Melospiza melodia pusillula</i>	FSC/CSC	Year-round inhabitant of saline emergent wetlands in the south San Francisco Bay.
San Pablo song sparrow <i>Melospiza melodia samuelis</i>	FSC/CSC	Year-round inhabitant of saline emergent wetlands of San Pablo Bay.
Black-crowned night heron <i>Nycticorax nycticorax</i>	--/*	Various wetland habitats, including salt, brackish, and freshwater marshes, swamps, streams, lakes, and agricultural fields. Nest in large trees, often with other herons or egrets.
Osprey <i>Pandion haliaetus</i>	--/CSC	Nests near freshwater lakes and large streams on large snags.
Double-crested cormorant <i>Phalacrocorax auritus</i>	--/*	Nests along coast on isolated islands or in trees along lake margins.
Purple martin <i>Progne subis</i>	--/CSC	Natural nesting sites include old woodpecker holes, snags, and sometimes under bark.
Mammals		
Pallid bat <i>Antrozous pallidus</i>	--/CSC	Roosts in large-diameter trees.
Townsend's big-eared bat <i>Corynorhinus townsendii townsendii</i>	FSC/CSC	Inhabits oak and conifer woodlands, broad-leaved forests, arid grasslands, deserts, and high mountain meadows.
Berkeley kangaroo rat <i>Dipodomys heermanni berkeleyensis</i>	FSC/*	Foothill grassland, oak/pine woodlands, and open chaparral.

Table F-1: Focused List of Special-Status Species with Potential to Occur in or Near Proposed Transportation 2035 Plan Improvements

Common Name Scientific Name	Listing Status USFWS/CDFG/ CNPS	General Habitat
OTHER SPECIES OF SPECIAL CONCERN		
Greater western mastiff bat <i>Eumops perotis californicus</i>	FSC/CSC	Breeds in rugged, rocky canyons and forages in a variety of habitats.
Western red bat <i>Lasiurus blossevillii</i>	--/CSC	Roosts in tree or shrub foliage in riparian habitat, adjacent to open fields, or in orchards.
San Pablo vole <i>Microtus californicus sanpabloensis</i>	--/CSC	Brackish-water emergent wetlands; largely confined to a few locations in San Pablo.
Long-eared myotis <i>Myotis evotis</i>	FSC/--	Inhabits woodlands and forests.
Fringed myotis <i>Myotis thysanodes</i>	FSC/--	Inhabits a variety of habitats, including pinyon-juniper woodland, valley-foothill hardwood, and hardwood-conifer forests.
Long-legged myotis <i>Myotis volans</i>	FSC/--	Inhabits forests and woodland habitats, primarily oak and juniper woodlands.
Yuma myotis <i>Myotis yumanensis</i>	FSC/--	Open forests and woodlands below 8,000 feet in close association with water bodies.
Mammals		
San Francisco dusky-footed woodrat <i>Neotoma fuscipes annectens</i>	FSC/CSC	Forests with moderate canopy cover and brushy understory.
Suisun shrew <i>Sorex ornatus sinuosus</i>	FSC/CSC	Restricted to natural tidal salt and brackish marshes.
Salt marsh wandering shrew <i>Sorex vagrans halicoetes</i>	FSC/CSC	Inhabits tidal salt marshes dense with pickleweed in the south San Francisco Bay.
Plants		
Sharsmith's onion <i>Allium sharsmithae</i>	--/--/IB.3	Rocky serpentine slopes in the Mt. Hamilton Range.
Montara manzanita <i>Arctostaphylos montaraensis</i>	--/--/IB.2	Maritime chaparral, coastal scrub.
Marin manzanita <i>Arctostaphylos virgata</i>	--/--/IB.2	Brushy slopes at the edge of closed-cone pine forests in Marin County.
Congdon's tarplant <i>Centromadia parryi</i> ssp. <i>congdonii</i>	FSC/CSC/ IB.2	Valley grassland.
San Francisco Bay spineflower <i>Chorizanthe cuspidata</i> var. <i>cuspidata</i>	FSC/--/IB.2	Coastal bluff scrub, coastal dunes, coastal prairie, on sandy soils.
Woolly-headed spineflower <i>Chorizanthe cuspidata</i> var. <i>villosa</i>	--/--/IB.2	Sandy soil, dunes, and northern coastal strand from Santa Cruz to Sonoma Counties.
Mt. Hamilton thistle <i>Cirsium fontinale</i> var. <i>campylon</i>	FSC/--/IB.2	Ultramafic seeps, sandy streams.
Lost thistle <i>Cirsium praeteriens</i>	--/--/IA	Ultramafic seeps, sandy streams.

Appendices

Appendix D: Biological Resources

Table F-1: Focused List of Special-Status Species with Potential to Occur in or Near Proposed Transportation 2035 Plan Improvements

Common Name Scientific Name	Listing Status USFWS/CDFG/ CNPS	General Habitat
OTHER SPECIES OF SPECIAL CONCERN		
Point Reyes bird's beak <i>Cordylanthus maritimus</i> ssp. <i>palustris</i>	FSC/--/IB.2	Once common to north-central coastal salt marshes, this species is now restricted to only a few locations from Point Reyes to west Berkeley and south.
Mt. Diablo bird's beak <i>Cordylanthus nidularius</i>	FSC/CR/IB.1	Serpentine slopes in chaparral habitats in Contra Costa County near Mt. Diablo.
Mt. Hamilton coreopsis <i>Coreopsis hamiltonii</i>	FSC/--/IB.2	Steep, shale talus, woodland.
Clustered lady's-slipper <i>Cypripedium fasciculatum</i>	FSC/--/4.2	Lower montane coniferous forests, north coast coniferous forests, usually serpentine seeps and streambanks.
Hospital Canyon larkspur <i>Delphinium californicum</i> ssp. <i>interius</i>	FSC/--/IB.2	Moist areas of the inner Coast Ranges from Contra Costa to Santa Clara counties.
Plants		
Recurved larkspur <i>Delphinium recurvatum</i>	FSC/--/IB.2	Alkali sink or valley and foothill grassland communities.
Western leatherwood <i>Dirca occidentalis</i>	--/--/IB.2	Broad-leaved upland forests, closed-cone coniferous forests, chaparral, cismontane woodland, north coast coniferous forests, riparian forests, riparian woodland; mesic sites.
Brandege's eriastrum <i>Eriastrum brandegeae</i>	FSC/--/IB.2	Volcanic material in chaparral and foothill woodlands.
Mt. Diablo buckwheat <i>Eriogonum truncatum</i>	--/--/IB.1	Chaparral, scrub, and grassland habitats of Alameda, Contra Costa, and Solano Counties.
Coast wallflower <i>Erysimum ammophilum</i>	FSC/--/IB.2	Sandy coastal habitats.
Diamond-petaled California poppy <i>Eschscholzia rhombipetala</i>	FSC/--/IB.1	Dry flats and brushy slopes below 3,500 feet in elevation.
Hillsborough chocolate lily <i>Fritillaria biflora</i> var. <i>ineziana</i>	--/--/IB.1	Cismontane woodland, grassland, on serpentinite.
Talus fritillary <i>Fritillaria falcata</i>	FSC/--/IB.2	Serpentine talus slopes in chaparral and foothill woodlands.
Marin checker lily <i>Fritillaria lanceolata</i> var. <i>tristulis</i>	--/--/IB.1	Coastal grasslands of western Marin County.
Fragrant fritillary <i>Fritillaria liliacea</i>	FSC/--/IB.2	Coastal scrub, valley and foothill grassland, coastal prairie; on heavy clay soils, often on ultramafic soils.
San Francisco gumplant <i>Grindelia hirsutula</i> var. <i>maritima</i>	FSC/--/IB.2	Coastal bluff scrub, coastal scrub, grasslands, on sandy or serpentinite soils.
Diablo helianthella <i>Helianthella castanea</i>	FSC/--/IB.2	Openings in chaparral and broad-leaved upland forest.

Table F-1: Focused List of Special-Status Species with Potential to Occur in or Near Proposed Transportation 2035 Plan Improvements

Common Name Scientific Name	Listing Status USFWS/CDFG/ CNPS	General Habitat
OTHER SPECIES OF SPECIAL CONCERN		
Brewer's western flax <i>Hesperolinon breweri</i>	FSC/--/IB.2	Grassy or brushy serpentine slopes within chaparral or foothill woodlands of the outer Coast Ranges; often partly shaded.
Drymaria-like western flax <i>Hesperolinon drymarioides</i>	FSC/--/IB.2	Dry slopes in foothill woodlands.
Carquinez goldenbush <i>Isocoma arguta</i>	FSC/--/IB.1	Slopes of the Carquinez Straits in Solano and Contra Costa Counties.
Plants		
Delta tule pea <i>Lathyrus jepsonii</i> var. <i>jepsonii</i>	FSC/--/IB.2	Natural edges of sloughs and rivers in the Sacramento – San Joaquin Delta.
Crystal Springs lessingia <i>Lessingia arachnoidea</i>	FSC/--/IB.2	Cismontane woodland, coastal scrub, grasslands, on serpentinite, often on roadcuts.
Smooth lessingia <i>Lessingia micradenia</i> var. <i>glabrata</i>	FSC/--/IB.2	Dry, open gravel slopes in serpentine or clay; from Santa Cruz Mountains.
Tamalpais lessingia <i>Lessingia micradenia</i> var. <i>micradenia</i>	FSC/--/IB.2	Chaparral and mixed evergreen forests on dry gravel or serpentine slopes; from Marin County.
Coast lily <i>Lilium maritimum</i>	FSC/--/IB.1	Sandy soils, but also in brush and woods in coastal scrub and coastal coniferous habitats.
Showy madia <i>Madia radiata</i>	--/--/IB.1	Grassy slopes in valley grasslands and foothill woodlands of the inner Coast Ranges from Contra Costa to Kern Counties.
Robust monardella <i>Monardella villosa</i> var. <i>globosa</i>	--/--/IB.2	Cismontane woodland, openings in chaparral.
Baker's navarretia <i>Navarretia leucocephala</i> ssp. <i>bakeri</i>	--/--/IB.1	Vernal pools in valley grasslands and foothill woodlands.
Marin County navarretia <i>Navarretia rosulata</i>	--/--/IB.2	Serpentine soils; noted in Marin County.
North coast phacelia <i>Phacelia insularis</i> var. <i>continentis</i>	FSC/--/IB.2	Coastal strand and sand dunes in Marin and to Mendocino Counties.
Mt. Diablo phacelia <i>Phacelia phacelioides</i>	FSC/--/IB.2	Cismontane woodland, chaparral.
Hairless popcorn-flower <i>Plagiobothrys glaber</i>	--/--/IA	Largely confined to coastal salt marsh habitats along the south shore of San Francisco Bay, but also located in alkaline meadows in Santa Clara Valley and further south.
Hooked popcorn-flower <i>Plagiobothrys uncinatus</i>	FSC/--/IB.2	Canyon sides and chaparral habitats.
Rayless ragwort <i>Senecio aphanactis</i>	--/--/2.2	Dry, open places including chaparral and coastal sage scrub.

Appendix D: Biological Resources

Table F-1: Focused List of Special-Status Species with Potential to Occur in or Near Proposed Transportation 2035 Plan Improvements

Common Name Scientific Name	Listing Status USFWS/CDFG/ CNPS	General Habitat
OTHER SPECIES OF SPECIAL CONCERN		
Marin checkerbloom <i>Sidalcea hickmanii</i> var. <i>viridis</i>	FSC/--/IB.3	Chaparral, usually on serpentinite.
San Francisco campion <i>Silene verecunda</i> var. <i>verecunda</i>	FSC/--/IB.2	Coastal bluff scrub, chaparral, coastal prairie, coastal scrub, grasslands with sandy soil.
Plants		
Most beautiful jewel-flower <i>Streptanthus albidus</i> ssp. <i>peramoenus</i>	FSC/--/IB.1	Serpentine grassland, chaparral.
Tamalpais jewel-flower <i>Streptanthus batrachopus</i>	FSC/--/IB.3	Serpentine outcrops within chaparral; reported from Contra Costa and Marin Counties.
San Francisco owl's-clover <i>Triphysaria floribunda</i>	FSC/--/IB.2	Coastal prairie and grasslands, on serpentinite.
Caper-fruited tropidocarpum <i>Tropidocarpum capparideum</i>	FSC/--/IB.1	Alkaline hills, grasslands.

FEDERAL: (U.S. Fish and Wildlife Service)

FE = Listed as Endangered (in danger of extinction) by the Federal Government.

FT = Listed as Threatened (likely to become Endangered within the foreseeable future) by the Federal Government.

FP = Proposed for Listing as Endangered or Threatened.

FC = Candidate to become a proposed species.

FSC = former Federal Species of Concern. Species designated as such were listed by the Sacramento FWS office until 2006, when they stopped maintaining their list. These species are still considered to be at-risk species by other federal and state agencies, as well as various organizations with recognized expertise such as the Audubon Society.

MMPA = Marine Mammal Protection Act

STATE: (California Department of Fish and Game)

CE = Listed as Endangered by the State of California

CT = Listed as Threatened by the State of California

CR = Listed as Rare by the State of California (plants only)

CSC = California Species of Special Concern

WL = Watch List

3503.5=Protection for nesting species of Falconiformes (hawks) and Strigiformes (owls)

*Special animal—listed on CDFG's Special Animals List

California Native Plant Society

List 1A=Plants presumed extinct in California

List 1B=Plants rare, Threatened, or Endangered in California and elsewhere

List 2= Plants rare, Threatened, or Endangered in California but more common elsewhere

List 3= Plants about which more information is needed

List 4= Plants of limited distribution

An extension reflecting the level of threat to each species is appended to each rarity category as follows:

.1 – Seriously endangered in California

.2 – Fairly endangered in California

.3 – Not very endangered in California

Sources: California Department of Fish and Game, 2008; Hickman et al., 1993; Zeiner and Laudenslayer, 1988-1990

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